METEOROLOGICAL OFFICE

Advisory Committee on Atmospheric Pollution

REPORT ON OBSERVATIONS IN THE YEAR ENDING MARCH 31, 1920

Forming the Sixth Report of the Committee for the Investigation of Atmospheric Pollution

INTRODUCTION.

THIS Report, being the Sixth Annual one, follows practically similar lines to the Fifth Report.

The delay in publication of Reports has been referred to previously and the steps taken to try and remedy this. There is still some delay in getting the returns from a few of the Stations, but on the whole it is satisfactory to be able to state that returns are sent in, as a rule, in good time and within the limits referred to in the last Report of the Committee. This enables the compilation and tabulation to be proceeded with and avoids the delay which would otherwise be incurred.

The following list shows the Stations in operation during the year 1919–20:—

Municipalities.	*Gauges.*
Birmingham	3
Kingston-on-Hull	1
London County Council	6
Corporation of London	1
Malvern	1
Newcastle-on-Tyne	1
Rochdale	1
Rothamsted	1
St. Helens	1
Southport	2
Glasgow	9
Stirling	1
Meteorological Office, London	1
	29

It will thus be seen that we have 29 gauges in operation at present, and some further Stations are about to start observations during the current year, including Wishaw and Worthing.

The Committee would again draw attention to the importance of making measurements of deposit in seaside and other health resorts. It is, of course, of great interest to know that there is a heavy deposit of soot and other impurities in certain cities and to observe the improvement or otherwise resulting from the efforts made to abate smoke, but it is also of importance that people selecting a health resort should have some data on which to judge the purity or otherwise of the air.

The returns received from all Observing Stations are not published in full in this Report as they have already appeared in THE LANCET. In two cases, however—i.e., St. Helens and Malvern, representing the high and low deposits respectively, the full returns are given.[1]

The full returns are available for reference in THE LANCET, and the following list gives the dates of issues in which these returns are to be found:—

Return for—							
April, 1919.	Published in THE LANCET of				Dec.	27th,	1919.
May,	,,	,,	,,	,,	,,	,,	,,
June,	,,	,,	,,	,,	Jan.	10th,	1920.
July,	,,	,,	,,	,,	,,	,,	,,
Aug.,	,,	,,	,,	,,	Feb.	14th,	,,
Sept.,	,,	,,	,,	,,	,,	,,	,,
Oct.,	,,	,,	,,	,,	Mch.	13th,	,,
Nov.,	,,	,,	,,	,,	,,	,,	,,
Dec.,	,,	,,	,,	,,	May	22nd,	,,
Jan., 1920.	,,	,,	,,	,,	,,	,,	,,
Feb.,	,,	,,	,,	,,	Aug.	14th,	,,
Mch.,	,,	,,	,,	,,	,,	,,	,,

[1] Although both Southwark Park and Ravenscourt Park, London, showed higher total deposits for the year, these were not selected as representative owing to the abnormally high deposits in April and June respectively.

List of tables.—The tables in this Report are similar to those published in the Fifth Report. A list is given below:—

1. Monthly deposit for two selected stations—i.e., St. Helens and Malvern, representative of high and low deposits respectively.
2. Total solids deposited monthly at all stations.
3. Mean monthly deposits at all stations for the summer half years—i.e., April to September, 1918 and 1919.
4. Mean monthly deposits at all stations for the winter half years—i.e., October to March, 1918–19 and 1919–20.

5 and 6. Classification of the stations under Groups A, B, C, and D, according to the amounts of the various elements of pollution for the same periods as in Nos. 3 and 4.

7 and 8. Totals of stations classed A, B, C, and D for each element of pollution for summer and winter months, prepared from Tables V. and VI., and for the same periods.

9. Comparison of mean monthly deposit during summer and winter.
10. Average deposit of each element of pollution for each month for the following groups of stations:—
   (Y) Two London stations.
   (Z) Four Glasgow stations.

(A) Total solids deposited in the summer months of 1919 expressed as percentages of the deposits in the summer months 1918.

(B) Total solids deposited in the winter months of 1919–20 expressed as percentages of the deposits in the same months 1918–19.

(C) Summary of the classification of Tables VII. and VIII. showing comparison of deposits for 1918–19 and 1919–20.

(D) Highest and lowest mean monthly deposits in 1919–20 in tons per square kilometre.

(E) Summary of Table IX. Comparison of summer and winter deposits for the year April, 1919, to March, 1920.

(F) Analysis of Table X. showing the months of highest and lowest deposit for each element of pollution.

In Table X. the figures for deposit for each month have been adjusted to a standard month of 30 days, as referred to in the last Report, in order to eliminate apparent discrepancies arising from the different number of days in the months.

THE STANDARD GAUGE.

In the last Report reference was made to the weathering of the enamel surface of the Standard Gauge, and to the fact that a varnish had been found which appeared to fulfil the necessary conditions. This varnish has been applied to the gauges which showed any indication of weathering, and so far appears to give satisfactory results.

The copper connexion, illustrated on p. iv. of the Fifth Report, has also been made and fixed to all the gauge vessels, so that errors arising from the dripping of water from the outside of the gauge vessel into the open necks of bottles, or from leakage of water outside the connexion to the bottle, should now be eliminated.

There has been some suspicion that the large deposit gauge, when exposed in windy positions, did not give a true record of the amount of rain. Attention was drawn to this by Mr. Baxendell, who observed that his gauge, situated at Woodvale Moss, Southport, a very exposed position, usually registered less rain than a standard rain gauge in the same place. Whether this effect is a real one has hardly been definitely established yet, but the Committee think it advisable to experiment on the point, and it has been suggested by Mr. Baxendell that a Nipher Shield should be fitted to the deposit gauge. One of the difficulties in ascertaining whether the gauge is registering exactly the correct amount of deposit is the absence of a standard to compare with. It is possible, though most improbable, that when the deposit gauge registers less rain than the standard rain gauge the latter may be at fault. It may be that the amount of solid deposit is affected quite differently from the rainfall. However, this is a point which should be capable of elucidation experimentally, and the Committee hope to be able to deal with it in the near future.

RESULTS OF YEAR ENDING MARCH 31ST, 1920.

Table I. is self-explanatory and shows the complete figures for two Stations representing high and low deposits respectively, and for which analyses are available.

Referring now to Table II., in which the total solids deposited monthly at all Stations are given, it will be seen that, although the Station showing the highest mean monthly deposit for the year is Southwark Park with 15·35 metric tons per square kilometre, it is probable that either Newcastle-on-Tyne or Rochdale, for which the full year's results were not obtainable, would have exceeded this figure. If the Stations be arranged in the order of mean monthly deposit for the year, as shown in the last column of Table II., the following result is obtained:—

	Metric tons per sq. kilometre.
Southwark Park	15·35
Ravenscourt Park	14·09
St. Helens	13·83
Richmond Park, Glasgow	12·15
Tollcross Park, Glasgow	11·69
Blythswood Square, Glasgow	11·43
Golden Lane, London	11·28
Botanic Gardens, Glasgow	10·91
Finsbury Park, London	10·78
Victoria Park, Glasgow	10·38
Ruchill Park, Glasgow	9·53
Alexandra Park, Glasgow	9·49
Bellahouston Park, Glasgow	8·87
London, Meteorological Office	8·43
Queen's Park, Glasgow	8·01
Victoria Park, London	7·50
Southport, Hesketh Park	6·41
Southport, Woodvale Moss	5·34
Rothamsted	4·11
Malvern	3·17

Comparison with Previous Figures.

In Tables III. and IV. the deposits for the two years have been compared for the summer and winter months respectively, and reference should now be made to these tables.

As in the previous Reports, the deposit of total solids will be used in what follows for comparison between the two years. The results shown in Tables III. and IV. have been summarised in

TABLE I.—*Monthly Deposit at Two Selected Stations, St. Helens and Malvern.*

Month.	Station.	Rainfall in millimetres.	Metric tons per square kilometre.								
			Insoluble matter.			Soluble matter.		Total solids.	Included in soluble matter.		
			Tar.	Carbonaceous other than tar.	Ash.	Loss on ignition.	Ash.		Sulphate as (SO_3).	Chlorine (Cl).	Ammonia (NH_3).
1919.											
April	St. Helens	45	0·06	1·67	0·86	1·80	4·50	8·89	1·35	1·02	0·05
,,	Malvern	46	—	0·20	0·33	0·28	1·10	1·93	0·51	0·10	Trace
May	St. Helens	16	0·05	0·38	1·11	0·18	1·05	2·78	0·48	0·19	0·01
,,	Malvern	24	—	0·23	0·26	0·33	0·82	1·63	0·41	0·07	Trace
June	St. Helens*	—	—	—	—	—	—	—	—	—	—
,,	Malvern	23	Trace	0·07	0·30	0·30	0·95	1·63	0·41	0·10	0·01
July	St. Helens	23	0·05	0·08	3·46	1·18	2·65	7·42	1·05	0·50	0·01
,,	Malvern	74	Trace	0·23	0·23	0·85	1·72	3·03	0·77	0·15	0·02
Aug.	St. Helens	127	0·20	2·64	4·98	3·99	6·60	18·41	3·30	1·65	0·18
,,	Malvern	62	Trace	0·18	1·00	1·10	4·30	6·58	2·75	1·03	0·01
Sept.	St. Helens	62	0·11	1·74	5·84	3·03	5·13	15·85	2·71	1·26	0·10
,,	Malvern	44	Nil	0·18	0·97	0·95	5·25	7·35	2·96	0·15	0·01
Oct.	St. Helens	65	0·32	3·29	8·21	0·48	3·55	15·85	1·03	0·64	0·08
,,	Malvern	62	—	0·05	0·12	0·61	1·38	2·16	0·74	0·12	0·01
Nov.	St. Helens	67	0·28	2·88	4·77	0·20	4·47	12·60	1·55	0·67	0·07
,,	Malvern	36	—	0·14	0·49	0·34	0·54	1·52	0·54	0·15	Trace
Dec.	St. Helens	132	0·17	3·45	5·18	1·98	6·62	17·40	2·36	1·98	0·11
,,	Malvern*	—	—	—	—	—	—	—	—	—	—
1920.											
Jan.	St. Helens	104	0·26	3·36	4·99	0·41	5·81	14·83	2·07	1·68	0·23
,,	Malvern	80	—	0·24	0·88	1·13	2·83	5·20	1·80	0·43	0·25
Feb.	St. Helens	72	0·08	0·86	1·11	1·02	4·16	7·23	1·42	1·31	0·05
,,	Malvern	18	Trace	0·07	0·20	0·26	0·77	1·32	0·36	0·05	Trace
Mar.	St. Helens	90	0·21	1·34	2·80	0·41	26·16	30·92	2·15	1·44	0·07
,,	Malvern	87	Trace	0·20	0·23	0·59	1·54	2·57	0·77	0·15	0·02

TABLE II.—*Total Solids Deposited Monthly at all Stations, in Metric Tons per Square Kilometre.*

Station.	1919.									1920.			Mean monthly deposit.
	April.	May.	June.	July.	Aug	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	
Kingston-upon-Hull	—	—	—	—	—	—	—	18·48	11·57	13·92	13·79	11·90	—
London:—													
Meteorological Office	12·11	3·84	6·20	6·96	8·27	3·74	6·91	6·65	11·05	11·91	10·36	13·21	8·43
Finsbury Park	11·26	4·38	5·73	15·73	13·86	4·13	14·36	17·70	18·23	8·83	5·48	9·63	10·78
Ravenscourt Park	19·59	—	44·65	7·53	8·72	12·19	—	7·02	15·48	—	6·00	5·60	14·09
Southwark Park	41·95	18·33	—	16·17	9·33	11·35	17·97	10·70	17·30	8·63	8·00	9·09	15·35
Victoria Park	5·90	1·72	3·84	3·97	7·05	6·17	15·09	19·12	—	5·53	6·42	7·64	7·50
Golden Lane	14·53	7·62	7·96	12·05	12·78	8·70	10·41	16·57	11·33	10·07	—	12·05	11·28
Malvern	1·93	1·63	1·63	3·03	6·58	7·35	2·16	1·52	—	5·20	1·32	2·57	3·17
Newcastle-on-Tyne	—	—	—	—	—	—	19·85	—	11·64	9·91	14·37	18·74	—
Rochdale	—	—	—	—	—	—	28·51	—	33·06	26·50	26·34	35·34	—
Rothamsted	—	3·07	2·83	4·17	4·96	3·43	3·80	6·59	5·28	4·13	3·27	3·70	4·11
St. Helens	8·89	2·78	—	7·42	18·41	15·85	15·85	12·60	17·40	14·83	7·23	30·92	13·83
Southport:—													
Hesketh Park	4·99	3·70	6·09	3·91	11·76	6·29	6·01	6·76	10·58	7·60	4·19	4·98	6·41
Woodvale Moss	2·98	2·56	5·33	3·55	9·28	9·76	6·27	4·05	6·58	4·55	3·85	5·30	5·34
Stirling	—	—	—	—	—	—	4·36†	4·36†	—	—	—	—	—
Glasgow:—													
Alexandra Park	7·06	6·15	12·58	7·22	10·01	8·16	5·85	—	13·09	13·74	9·36	11·21	9·49
Bellahouston Park	9·89	7·86	11·83	6·50	7·04	6·43	4·85	12·45	10·97	13·43	9·71	5·51	8·87
Blythswood Square	8·14	7·05	16·07	—	11·14	12·92	6·40	—	13·68	13·74	13·26	11·85	11·43
Botanic Gardens	11·39	9·91	13·27	8·86	9·96	8·27	7·77	11·82	14·20	14·75	9·55	11·16	10·91
Queen's Park	10·15	6·70	11·28	7·41	7·06	7·05	3·77	11·37	9·07	8·27	7·25	6·72	8·01
Richmond Park	20·22	7·29	12·95	9·05	10·84	10·58	6·96	18·47	15·77	14·71	8·90	10·00	12·15
Ruchill Park	8·88	5·71	13·21	7·42	10·91	8·98	6·45	11·59	—	13·38	9·93	8·41	9·53
Tollcross Park	9·16	—	13·98	8·97	15·01	13·09	7·95	12·59	15·15	13·47	11·26	7·97	11·69
Victoria Park	9·90	6·66	14·99	7·55	10·69	11·29	6·39	—	11·47	12·33	10·32	12·56	10·38

* No returns † Average of two months

TABLE III.—SUMMER RESULTS.

Comparison of Mean Monthly Deposits for each Station for Half Years April to September, 1918 and 1919.

Station.	—	Rainfall in millimetres.	Metric tons per square kilometre.									No. of months used for mean.
			Insoluble matter.			Soluble matter.		Total solids.	Included in soluble matter.			
			Tar.	Carbonaceous other than tar.	Ash.	Loss on ignition.	Ash.		Sulphate as (SO_3).	Chlorine (Cl).	Ammonia (NH_3).	
London :—												
Meteorological Office ...	1918	70	1·10	1·91	2·76	2·00	4·78	11·55	1·59	0·69	0·22	5
	1919	46	0·11	1·50	1·93	1·87	1·45	6·85	0·72	0·54	0·05	6
Finsbury Park	1918	51	0·06	1·59	7·86	1·69	3·34	14·55	1·45	0·37	0·07	5
	1919	46	0·09	1·02	4·18	1·48	2·42	9·18	1·42	0·37	0·07	6
Ravenscourt Park ...	1918	57	0·07	1·74	5·10	1·75	2·89	11·54	1·35	0·40	0·16	6
	1919	41	0·16	3·31	10·36	1·98	2·73	18·53	1·66	0·52	0·18	5
Southwark Park	1918	43	0·08	1·83	5·61	2·74	3·80	14·05	2·21	0·53	0·14	6
	1919	45	0·06	3·76	7·71	4·30	3·60	19·43	3·75	0·64	0·29	5
Victoria Park	1918	40	0·06	1·84	7·20	1·12	2·06	12·27	1·20	0·25	0·09	5
	1919	33	0·03	0·56	1·43	1·08	1·68	4·78	1·21	0·28	0·11	6
Golden Lane	1918	77	0·10	2·63	3·63	1·75	4·29	12·39	2·07	0·86	0·28	6
	1919	41	0·08	2·28	4·05	1·19	3·02	10·61	1·54	0·54	0·62	6
St. Helens	1918	90	0·32	2·49	5·54	2·74	5·34	16·46	2·63	1·60	0·23	6
	1919	55	0·09	1·30	3·25	2·04	3·99	10·67	1·78	0·92	0·07	5
Southport :—												
Hesketh Park	1918	90	0·02	0·37	0·48	1·58	4·18	6·63	1·67	0·67	0·08	6
	1919	46	0·02	0·51	1·48	0·96	3·16	6·12	1·07	0·46	0·04	6
Woodvale Moss...	1918	83	—	—	—	—	—	6·33	—	—	—	6
	1919	40	—	—	—	—	—	5·58	—	—	—	6
Glasgow :—												
Alexandra Park	1918	56	0·11	2·53	3·85	1·21	2·54	10·26	1·39	0·18	0·12	6
	1919	46	0·05	1·27	3·13	1·42	2·67	8·53	1·50	0·41	0·10	6
Bellahouston Park ...	1918	52	0·10	1·39	4·02	1·31	2·69	9·52	1·42	0·16	0·04	5
	1919	45	0·08	1·49	2·43	1·05	3·17	8·26	1·45	0·26	0·06	6
Blythswood Square ...	1918	62	0·10	1·61	3·30	1·48	2·48	8·97	1·49	0·19	0·15	6
	1919	56	0·10	1·79	4·06	2·01	3·10	11·06	1·62	0·28	0·14	5
Botanic Gardens	1918	72	0·17	1·73	3·97	2·58	4·03	12·48	1·83	0·20	0·07	6
	1919	53	0·05	1·31	3·25	1·81	3·86	10·28	1·89	0·22	0·06	6
Queen's Park...	1918	69	0·11	1·13	3·02	1·79	4·03	10·07	1·64	0·22	0·07	6
	1919	52	0·03	1·11	2·57	1·08	3·46	8·28	1·52	0·19	0·06	6
Richmond Park	1918	50	0·13	1·49	4·14	1·94	2·93	10·64	1·63	0·26	0·12	5
	1919	49	0·06	2·06	3·62	1·85	4·03	11·82	1·80	0·31	0·10	6
Ruchill Park	1918	58	0·16	1·88	3·53	1·62	2·85	10·02	1·59	0·16	0·07	6
	1919	58	0·05	1·38	3·29	1·31	3·15	9·19	1·57	0·23	0·08	6
Tollcross Park	1918	48	0·16	1·73	4·86	2·52	3·19	12·45	1·57	0·17	0·08	5
	1919	55	0·09	2·00	4·38	1·54	4·04	12·05	1·93	0·23	0·08	5
Victoria Park...	1918	60	0·11	1·49	3·93	2·09	2·54	10·18	1·56	0·25	0·09	5
	1919	54	0·04	1·21	3·15	1·77	4·01	10·18	2·29	0·23	0·11	6

Tables A and B. In Table A the Stations are divided into two groups, those showing an increased deposit in the summer of 1919 and those showing a diminished deposit when compared with the same months of 1918. In Table B the winter months have been dealt with in a similar manner.

Turning now to the summary shown in Table A, we find that only four Stations show an increased deposit, two of these being in London and two in Glasgow. On the other hand, 12 Stations show a diminished deposit in the summer of 1919 when compared with 1918. This diminution is very well marked in the majority of the Stations referred to.

Referring to the Fifth Report, for 1918–19, it will be seen that the same conditions held good when the deposits for the summer of 1918 were compared with those for 1917. In 1918 the Meteorological Office gauge showed an increased deposit amounting to 108 per cent. of the 1917 figure, whereas in 1919 the summer deposit at the same Station had fallen to 59 per cent. of the 1918 deposit. This gauge is on the roof and subject to special conditions. Building operations were going on close to it in 1917. The deposit in Ravenscourt Park and Southwark Park during the summer of 1919 was 160 per cent. and 138 per cent. respectively of the deposit for the same Stations in 1918. On the other hand, as shown in the Fifth Report, the same two Stations in 1918 showed a diminution of deposit compared with 1917, the percentages of the 1917 deposit being respectively 67 per cent. and 82 per cent. We thus find an erratic variation from year to year, Stations showing a diminution one year may show an increase the following, and vice versa.

The two Glasgow Stations—i.e., Blythswood Square and Richmond Park, shown in Table A as having an increased deposit in 1919, both had a diminished deposit in 1918 when compared with the previous year.

TABLE IV.—WINTER RESULTS.

Comparison of Mean Monthly Deposit for Each Station for Half Years October to March, 1918–19, and 1919–20.

Station.	—	Rainfall in millimetres.	Metric tons per square kilometre.									No. of months used for mean.
			Insoluble matter.			Soluble matter.		Total solids.	Included in soluble matter.			
			Tar.	Carbonaceous other than tar.	Ash.	Loss on ignition.	Ash.		Sulphate as (SO_3).	Chlorine (Cl).	Ammonia (NH_3).	
London:—												
Meteorological Office ...	1918–19	46	0·14	1·72	4·59	1·33	3·56	10·13	1·33	0·62	0·04	4
	1919–20	35	0·23	2·30	4·50	1·38	1·60	10·02	0·69	0·66	0·04	6
Finsbury Park	1918–19	75	0·19	1·36	4·25	4·38	7·90	17·99	4·79	1·49	0·11	6
	1919–20	44	0·09	1·49	4·72	2·06	4·02	12·37	2·15	0·52	0·08	6
Ravenscourt Park ...	1918–19	56	0·08	1·25	2·45	3·13	4·80	11·72	2·83	0·85	0·13	6
	1919–20	34	0·07	0·93	2·71	1·74	3·08	8·53	1·64	0·43	0·13	4
Southwark Park	1918–19	46	0·13	1·83	3·98	6·79	6·70	19·46	6·35	1·05	0·45	6
	1919–20	39	0·08	1·77	3·60	2·17	4·33	11·95	2·34	0·60	0·13	6
Victoria Park...	1918–19	32	0·03	0·95	2·27	2·11	4·91	10·29	1·86	0·40	0·05	4
	1919–20	30	0·06	1·57	4·26	1·73	3·14	10·76	1·76	0·47	0·06	5
Golden Lane	1918–19	57	0·09	3·24	4·08	1·68	4·47	13·57	2·11	0·84	0·18	6
	1919–20	42	0·06	2·72	4·13	1·60	3·58	12·09	1·72	0·80	0·20	5
Malvern	1918–19	39	—	0·33	1·36	0·61	2·24	4·55	0·90	0·23	0·01	1
	1919–20	57	—	0·14	0·38	0·59	1·41	2·56	0·84	0·18	0·06	5
Newcastle-on-Tyne	1918–19	50	0·14	4·41	7·89	2·18	3·96	18·58	1·81	0·54	0·15	6
	1919–20	73	0·30	3·11	5·69	2·10	3·70	14·90	1·91	0·74	0·13	5
Rochdale	1918–19	144	—	—	—	—	—	23·16	—	—	—	3
	1919–20	136	—	—	—	—	—	29·95	—	—	—	5
St. Helens...	1918–19	83	0·20	2·22	3·73	3·71	9·20	19·08	4·63	2·21	0·05	6
	1919–20	88	0·22	2·53	4·51	0·75	8·46	16·47	1·76	1·29	0·10	6
Southport:—												
Hesketh Park	1918–19	95	0·03	0·68	1·51	1·28	4·21	7·71	1·63	0·92	0·01	6
	1919–20	79	0·03	0·54	1·03	1·24	3·84	6·69	1·23	0·82	0·06	6
Woodvale Moss	1918–19	71	—	—	—	—	—	5·64	—	—	—	6
	1919–20	66	—	—	—	—	—	5·10	—	—	—	6
Glasgow:—												
Alexandra Park	1918–19	66	0·09	2·20	3·81	2·35	4·66	13·10	2·32	0·38	0·14	6
	1919–20	81	0·05	1·19	2·65	2·84	3·92	10·65	1·92	1·14	0·12	5
Bellahouston Park ...	1918–19	79	0·04	1·57	2·69	3·30	6·15	13·75	2·99	0·38	0·10	1
	1919–20	88	0·05	0·88	1·67	2·62	4·27	9·49	1·89	1·49	0·06	6
Blythswood Square ...	1918–19	86	0·19	2·82	4·55	2·48	5·62	15·67	3·14	0·42	0·22	6
	1919–20	96	0·08	1·10	2·85	3·12	4·64	11·79	2·12	1·44	0·14	5
Botanic Gardens	1918–19	96	0·13	2·52	4·32	4·97	8·82	20·74	4·64	0·61	0·18	6
	1919–20	97	0·07	1·30	2·52	2·97	4·68	11·54	2·49	1·13	0·12	6
Queen's Park	1918–19	84	0·08	1·48	3·13	2·31	5·33	12·33	2·68	0·36	0·18	6
	1919–20	101	0·06	0·76	1·62	1·86	3·45	7·74	1·72	1·15	0·08	6
Richmond Park	1918–19	61	0·09	1·88	3·03	3·29	4·61	12·90	3·32	0·32	0·16	1
	1919–20	102	0·09	1·42	3·65	2·76	4·54	12·47	2·28	1·22	0·33	6
Ruchill Park	1918–19	92	0·11	1·79	2·63	2·37	4·65	11·56	2·79	0·36	0·17	6
	1919–20	97	0·07	1·39	2·39	2·54	3·56	9·95	2·34	1·11	0·12	5
Tollcross Park	1918–19	61	0·08	1·76	4·33	2·10	5·00	13·27	2·95	0·38	0·16	1
	1919–20	97	0·10	1·43	3·26	2·45	4·16	11·40	2·44	1·09	0·11	6
Victoria Park...	1918–19	98	0·04	1·29	2·55	3·95	7·88	15·71	5·44	0·55	0·13	1
	1919–20	96	0·11	1·12	1·95	2·95	4·49	10·61	1·95	1·30	0·12	5

Generally speaking, however, there is evidence of a considerable diminution of summer deposit in practically all the districts in which the deposit gauges have been set up.

Turning now to an examination of the deposit during the winter months, and referring to Table B. Out of 21 Stations included in the table only two showed an increased deposit during the winter of 1919–20 compared with the previous winter, these two being Victoria Park, London, with 104 per cent. of the 1918–19 deposit, and Rochdale with 129 per cent. of the 1918–19 deposit. On the other hand, 19 Stations showed a diminished deposit during the winter of this year, the greatest diminution being shown in Malvern and the Botanic Gardens, Glasgow, both with 56 per cent. of the previous winter's deposit, and the least reduction being the Meteorological Office Station, London, with 99 per cent. of the previous winter's deposit.

It is necessary to keep in mind that this comparison is made on the total solids only, and for a comparison of each of the elements of the deposit reference must be made to Tables III. and IV., which give the figures in full, as to deal with each element here would occupy too much space.

It is satisfactory to note generally that the deposit at practically all stations has diminished during the winter and the summer of 1919–20, as compared with the previous year.

TABLE A.—*Total Solids Deposited in Summer Months, 1919, expressed as Percentages of Deposits in the same months 1918.*

Deposit.			
Increased in 1919.		Diminished in 1919.	
	%		%
London :—		London :—	
Ravenscourt Park ...	160	Meteorological Office...	59
Southwark Park... ...	138	Finsbury Park	63
		Victoria Park	—
		Golden Lane	86
		St. Helens	65
		Southport :—	
		Hesketh Park	92
		Woodvale Moss...	88
Glasgow :—		Glasgow :—	
Blythswood Square ...	123	Alexandra Park	83
Richmond Park	111	Bellahouston Park ...	87
		Botanic Gardens	82
		Queen's Park...	82
		Ruchill Park	92
		Tollcross Park	97

TABLE B.—*Total Solids Deposited in Winter Months 1919–20 Expressed as Percentages of Deposits in the Same Months, 1918–19.*

Deposit.			
Increased in 1919-20.		Diminished in 1919-20.	
	%		%
London :—		London :—	
Victoria Park	104	Meteorological Office	99
Rochdale	129	Finsbury Park	69
		Ravenscourt Park ...	73
		Southwark Park	61
		Golden Lane	89
		Malvern	56
		Newcastle-on-Tyne	80
		St. Helens	87
		Southport :—	
		Hesketh Park	87
		Woodvale Moss	90
		Glasgow :—	
		Alexandra Park	82
		Bellahouston Park ...	69
		Blythswood Square ...	75
		Botanic Gardens ...	56
		Queen's Park...	63
		Richmond Park	97
		Ruchill Park	86
		Tollcross Park	86
		Victoria Park...	68

TABLE V.—*Classification (Summer Months), April to September, 1919.*

Station.	Rainfall in mm.	Insoluble matter.			Soluble matter.		Total solids.	Included in soluble matter.			No. of months.	Summary.			
		Tar.	Carbonaceous other than tar.	Ash.	Loss on ignition.	Ash.		Sulphate as (SO_3).	Chlorine (Cl).	Ammonia (NH_3).		A	B	C	D
London :—															
Meteorological Office	46	B	B	A	B	A	B	A	B	B	6	3	6	0	0
Finsbury Park	46	B	B	B	B	B	B	B	B	B	6	0	9	0	0
Ravenscourt Park ...	41	C	C	D	B	B	C	B	B	C	5	0	4	4	1
Southwark Park ...	45	B	C	C	D	B	C	C	B	D	5	0	3	4	2
Victoria Park	33	A	A	A	B	B	A	B	A	B	6	5	4	0	0
Golden Lane	41	B	B	B	B	B	B	B	B	D	6	0	8	0	1
Malvern	46	A	A	A	A	B	A	B	A	A	6	7	2	0	0
St. Helens	55	B	B	B	B	B	B	B	C	B	5	0	8	1	0
Southport :—															
Hesketh Park	46	A	A	A	B	B	B	B	B	A	6	4	5	0	0
Woodvale Moss... ...	40	—	—	—	—	—	B	—	—	—	6	0	1	0	0
Glasgow :—															
Alexandra Park ...	46	B	B	B	B	B	B	B	B	B	6	0	9	0	0
Bellahouston Park ...	45	B	B	B	B	B	B	B	A	B	6	1	8	0	0
Blythswood Square...	56	B	B	B	B	B	B	B	A	B	5	1	8	0	0
Botanic Gardens ...	53	B	B	B	B	B	B	B	A	B	6	1	8	0	0
Queen's Park	52	A	B	B	B	B	B	B	A	B	6	2	7	0	0
Richmond Park ...	49	B	B	B	B	B	B	B	B	B	6	0	9	0	0
Ruchill Park	58	B	B	B	B	B	B	B	A	B	6	1	8	0	0
Tollcross Park	55	B	B	B	B	B	B	B	A	B	5	1	8	0	0
Victoria Park	54	A	B	B	B	B	B	B	A	B	6	2	7	0	0

Classification under Letters A, B, C, and D.

The method of classifying under the letters A, B, C, and D has been fully explained in previous Reports, but to avoid the necessity for reference to these the basis of the classification is given herewith.

Class A includes the Stations which have less than 1 unit of deposit per square kilometre.

Class B, the Stations which have between 1 and 3 units of deposit per square kilometre.

Class C, the Stations which have between 3 and 5 units of deposit per square kilometre.

Class D, the Stations which have 5 or more units of deposit per square kilometre.

The unit has been adjusted to suit each separate element, but the proportional division has been kept the same throughout. Thus for "total solids" the unit is 5 tons, and the law of classification is:—

Class A, less than 5 tons per square kilometre per month.

Class B, from 5 to 15 tons per square kilometre per month.

Class C, from 15 to 25 tons per square kilometre per month.

Class D, 25 or more tons per square kilometre per month.

It will be understood that the figure 5 belongs to Class B, not Class A, and so on. The units and limits in the several cases are shown in tabular form below.

Insoluble Matter.

Unit.		Limits.			
—	Tons per sq. kilo. per month	A Less than	B	C	D over
Tar	0·05	0·05	0·05 to 0·15	0·15 to 0·25	0·25
Carbonaceous other than tar	1	1	1 to 3	3 to 5	5
Ash	2	2	2 to 6	6 to 10	10

Soluble Matter.

Loss on ignition	0·75	0·75	0·75 to 2·25	2·25 to 3·75	3·75
Ash	1·5	1·5	1·5 to 4·5	4·5 to 7·5	7·5
Total solids	5	5	5 to 15	15 to 25	25
Sulphates ...	1	1	1 to 3	3 to 5	5
Chlorine ...	0·3	0·3	0·3 to 0·9	0·9 to 1·5	1·5
Ammonia ...	0·05	0·05	0·05 to 0·15	0·15 to 0·25	0·25

TABLE VI.—*Classification (Winter Months), October, 1919, to March, 1920.*

Station.	Rainfall in mm.	Insoluble matter.			Soluble matter.		Total solids.	Included in soluble matter.			No. of months.	Summary.			
		Tar.	Carbonaceous other than tar.	Ash.	Loss on ignition.	Ash.		Sulphate as (SO_3).	Chlorine (Cl).	Ammonia (NH_3).		A	B	C	D
Birmingham:—															
Central	55	B	C	C	B	B	C	B	B	B	3	0	6	3	0
Aston	52	B	B	B	B	B	B	B	B	A	3	1	8	0	0
S.W.	75	A	A	A	A	B	B	B	A	B	1	5	4	0	0
Kingston-on-Hull	61	C	B	B	B	C	B	B	C	B	5	0	6	3	0
London:—															
Meteorological Office	35	C	B	B	B	B	B	A	B	A	6	2	6	1	0
Finsbury Park	44	B	B	B	B	B	B	B	B	B	6	0	9	0	0
Ravenscourt Park ...	34	B	A	B	B	B	B	B	B	B	4	1	8	0	0
Southwark Park ...	39	B	B	B	B	B	B	B	B	B	6	0	9	0	0
Victoria Park	30	B	B	B	B	B	B	B	B	B	5	0	9	0	0
Golden Lane	42	B	B	B	B	B	B	B	B	C	5	0	8	1	0
Malvern	57	A	A	A	A	A	A	A	A	B	5	8	1	0	0
Newcastle-on-Tyne ...	73	D	C	B	B	B	B	B	B	B	5	0	7	1	1
Rochdale	136	—	—	—	—	—	D	—	—	—	5	—	—	—	—
Rothamsted	48	—	A	A	B	B	A	—	—	—	6	3	2	—	—
St. Helens	88	C	B	B	B	D	C	B	C	B	6	0	5	3	1
Southport:—															
Hesketh Park	79	A	A	A	B	B	B	B	B	B	6	3	6	0	0
Woodvale Moss ...	66	—	—	—	—	—	B	—	—	—	6	—	1	—	—
Glasgow:—															
Alexandra Park ...	81	B	B	B	C	B	B	B	C	B	5	0	7	2	0
Bellahouston Park ...	88	B	A	A	C	B	B	B	C	B	6	2	5	2	0
Blythswood Square ...	96	B	B	B	C	C	B	B	C	B	5	0	6	3	0
Botanic Gardens ...	97	B	B	B	C	C	B	B	C	B	6	0	6	3	0
Queen's Park	101	B	A	A	B	B	B	B	C	B	6	2	6	1	0
Richmond Park ...	102	B	B	B	C	C	B	B	C	D	6	0	5	3	1
Ruchill Park	97	B	B	B	C	B	B	B	C	B	5	0	7	2	0
Tollcross Park	97	B	B	B	C	B	B	B	C	B	6	0	7	2	0
Victoria Park	96	B	B	A	C	B	B	B	C	B	5	1	6	2	0

This classification is based upon the figures shown in the two previous tables (III. and IV.) and covers the same periods—i.e., summer and winter.

As in the previous Reports, the Tables V. and VI. have been summarised in Tables VII. and VIII. The Stations used in Table VII. are those which have a complete five or six months' observations in the period under consideration. The same remark applies to Table VIII.

These two tables have been further summarised by the addition of the A's and B's and of the C's and D's, the results being given below.

TABLE VII.

Comparison of Totals of Classes A, B, C, D for Each Element of Pollution for the Two Half Years April–September, 1918–19, for 17 Stations.

—		—	A	B	C	D
Total solids		1918	0	16	1	0
		1919	1	14	2	0
Insoluble. Tar		1918	1	12	3	1
		1919	4	12	1	0
Insoluble. Carbonaceous other than tar		1918	1	16	0	0
		1919	2	13	2	0
Insoluble. Ash		1918	1	14	2	0
		1919	3	12	1	1
Soluble. Loss on ignition		1918	0	13	4	0
		1919	0	16	0	1
Soluble. Ash		1918	0	15	2	0
		1919	1	16	0	0
Sulphates		1918	0	17	0	0
		1919	1	15	1	0
Chlorine		1918	10	6	0	1
		1919	8	8	1	0
Ammonia		1918	1	11	4	1
		1919	1	13	1	2

The Stations used in Table VII. are those with 5 or 6 months' of Observations in the Summer of 1918 and 1919.

—	1918.	1919.
	No. of months.	
London:—		
Meteorological Office	5	6
Finsbury Park	5	6
Ravenscourt Park	6	5
Southwark Park	6	5
Victoria Park	5	6
Golden Lane	6	6
St. Helens	6	5
Southport:—		
Hesketh Park	6	6
Glasgow:—		
Alexandra Park	6	6
Bellahouston Park	5	6
Blythswood Square	6	5
Botanic Gardens	6	6
Queen's Park	6	6
Richmond Park	5	6
Ruchill Park	6	6
Tollcross Park	5	5
Victoria Park	5	6

TABLE VIII.

Comparison of Totals of Classes A, B, C, D for Each Element of Pollution for the Two Half Years October–March, 1918–19 and 1919–20, for 11 Stations.

—	—	A	B	C	D
Total solids	1918–19	0	5	6	0
	1919–20	0	10	1	0
Insoluble. Tar	1918–19	1	7	3	0
	1919–20	1	8	1	1
Insoluble. Carbonaceous other than tar	1918–19	1	8	2	0
	1919–20	2	8	1	0
Insoluble. Ash	1918–19	1	9	1	0
	1919–20	2	9	0	0
Soluble. Loss on ignition	1918–19	0	3	5	3
	1919–20	0	7	4	0
Soluble. Ash	1918–19	0	3	5	3
	1919–20	0	8	2	1
Sulphates	1918–19	0	6	4	1
	1919–20	0	11	0	0
Chlorine	1918–19	0	7	3	1
	1919–20	0	5	6	0
Ammonia	1918–19	2	3	5	1
	1919–20	0	10	1	0

List of Stations used in Table VIII.

—	No. of months with observations.	
	918–19.	1919–20.
London:—		
Finsbury Park	6	6
Southwark Park	6	6
Golden Lane	6	5
Newcastle-on-Tyne	6	5
St. Helens	6	6
Southport:—		
Hesketh Park	6	6
Glasgow:—		
Alexandra Park	6	5
Blythswood Square	6	5
Botanic Gardens	6	6
Queen's Park	6	6
Ruchill Park	6	5

We may now compare the two years by examining the column showing the sum of the C's and D's, as this figure varies directly with the amount of deposit—i.e., an increase of the sum of the C's and D's means an increase of deposit, a diminution of the sum means a reduced deposit.

The results obtained by comparison on these lines are as follows:—

Total Solids.—This shows a reduced deposit during the winter and an increased deposit during the summer, as compared with the previous year.

Tar, Loss on Ignition, Soluble Ash, and Ammonia all show a reduced deposit both in the summer and winter when compared with 1918–19.

Insoluble Carbonaceous Matter other than Tar and Sulphates show a reduced deposit in the winter of 1919–20 compared with the previous winter, and an increased deposit in the summer when compared with the previous summer.

TABLE C.—*Comparison of Deposits for 1918–19 with 1919–20.*

	—	Year.	April to Sept (17 stations).		Oct. to March (11 stations).	
			A & B.	C & D.	A & B.	C & D.
	Total solids ...	1918–1919	16	1	5	6
		1919–1920	15	2	10	1
Insoluble.	Tar	1918–1919	13	4	8	3
		1919–1920	16	1	9	2
Insoluble.	Carbonaceous other than tar	1918–1919	17	0	9	2
		1919–1920	15	2	10	1
Insoluble.	Ash	1918–1919	15	2	10	1
		1919–1920	15	2	11	0
Soluble.	Loss on ignition	1918–1919	13	4	3	8
		1919–1920	16	1	7	4
Soluble.	Ash	1918–1919	15	2	3	8
		1919–1920	17	0	8	3
	Sulphates	1918–1919	17	0	6	5
		1919–1920	16	1	11	0
	Chlorine	1918–1919	16	1	7	4
		1919–1920	16	1	5	6
	Ammonia	1918–1919	12	5	5	6
		1919–1920	14	3	10	1

Insoluble Ash shows a reduced deposit during the winter of 1919-20 compared with the previous winter, while the deposits in the summer months of the two years were equal.

Chlorine gave a higher deposit in the winter of 1919–20, while the deposits during the summer months of the two years were equal.

It will be understood that this comparison, being made upon the classification already described under the letters A, B, C, D, while giving a fair indication of the relative amounts of deposit in the two years, must not be taken as absolutely accurate, since there is a certain amount of latitude in the amount of deposit which would be classified under any of the letters.

Comparison of Stations.

In Table D the Stations giving the highest and lowest mean monthly deposit for the years for each of the elements of pollution considered are shown. Rochdale has been included owing to the exceptionally high deposit, although only four months were available, the four months being October, December, January, and February, and total solids only was returned. These being winter months probably give a somewhat higher mean monthly deposit than if the whole year's records were available, but seeing that the figure for Rochdale—i.e., 29·95 for total solids—is nearly double the next highest the inclusion of the rest of the year is not likely to alter the order. The second highest mean monthly deposit occurred in Southwark Park, London.

The highest mean monthly deposit of tar was in the experimental gauge on the roof of the Meteorological Office, London, and amounted to 0·17 ton per square kilometre, the next highest being St. Helens with 0·16.

London again heads the list for Insoluble Carbonaceous and Ash, Soluble Loss on Ignition,

TABLE D.—*Highest and Lowest Mean Monthly Deposits in 1919–20, in Tons per Square Kilometre.*

	—	Highest.		Lowest.	
	Total solids	*Rochdale	29·95	Malvern	3·17
		London— Southwark Park	15·35	Rothamsted	4·11
Insoluble.	Tar	London— Meteorological Office	0·17	Malvern	trace
		St. Helens	0·16	Rothamsted	0·0
Insoluble.	Carbonaceous other than tar	London— Southwark Park	2·67	Malvern	0·16
		Golden Lane	2·48	Rothamsted	0·40
Insoluble.	Ash	London— Ravenscourt Park	6·96	Malvern	0·46
		Southwark Park	5·47	Rothamsted	0·57
Soluble.	Loss on ignition	London— Southwark Park	3·14	Malvern	0·61
		Glasgow— Blythswood Square	2·56	Southport— Hesketh Park	1·10
Soluble.	Ash	St. Helens	6·43	London— Meteorological Office	1·52
		Glasgow— Richmond Park	4·28	Malvern	1·93
	Sulphates	London— Southwark Park	2·98	London— Meteorological Office	0·70
		Glasgow— Tollcross Park	2·21	Malvern	1·09
	Chlorine	St. Helens	1·12	Malvern	0·23
		Glasgow— Bellahouston Park	0·87	London— Victoria Park	0·37
	Ammonia	London— Golden Lane	0·43	Malvern	0·03
		Glasgow— Richmond Park	0·21	London— Meteorological Office	0·05
				Southport— Hesketh Park	0·05

* Four months only.

Sulphates and Ammonia; the highest mean monthly deposit of Insoluble Carbonaceous Matter, Soluble Loss on Ignition, and Sulphates being in Southwark Park, of Insoluble Ash in Ravenscourt Park, and of Ammonia in Golden Lane. The highest mean monthly deposit of Chlorine was in St. Helens.

Turning now to the Stations showing the lowest mean monthly deposits we find that in nearly every case Malvern heads the list, the exceptions being Soluble Ash and Sulphates, which were lowest in the Meteorological Office gauge.

In many cases, however, Rothamsted showed the second lowest mean monthly deposit, this being the case for Total Solids, Tar, Insoluble Carbonaceous, and Ash.

Seasonal Variations.

Reference must now be made to Table IX., in which the mean monthly deposit for the summer and winter months of the year is given.

Table IX has been further summarised in Table E, which we may now consider.

Rainfall.—Out of 20 Stations considered, in 15 the rainfall in the winter was greater than the summer, whereas in 5 Stations the summer rainfall was the greater.

Total Solids.—14 out of the 20 Stations showed a higher deposit in the winter and 6 a higher summer deposit.

Tar.—In 11 Stations the winter deposit was greater; in 3 the summer and winter deposits were equal; while in 4 the summer deposit was greater, the total considered in this case being 18 Stations.

Insoluble Carbonaceous.—In 7 Stations out of 18 the winter deposit was greater than the summer, while in 11 Stations the summer deposit was the greater. This is a somewhat curious result, but, as already pointed out, it must be kept in mind that

TABLE IX.—*Comparison of Mean Monthly Deposits for Summer and Winter Months of the Year 1919–20.*

Station.	—	Rainfall in millimetres.	Metric tons per square kilometre.									No. of months used for mean.
			Insoluble matter.			Soluble matter.		Total solids.	Included in soluble matter.			
			Tar.	Carbonaceous other than tar.	Ash.	Loss on ignition.	Ash.		Sulphate as (SO_3).	Chlorine (Cl).	Ammonia (NH_3).	
London—												
Meteorological Office ...	Apl.-Sep.	46	0·11	1·50	1·93	1·87	1·45	6·85	0·72	0·54	0·05	6
	Oct.-Mch.	35	0·23	2·30	4·50	1·38	1·60	10·02	0·69	0·66	0·04	6
Finsbury Park	Apl.-Sep.	46	0·09	1·02	4·18	1·48	2·42	9·18	1·42	0·37	0·07	6
	Oct.-Mch.	44	0·09	1·49	4·72	2·06	4·02	12·37	2·15	0·52	0·08	6
Ravenscourt Park ...	Apl.-Sep.	41	0·16	3·31	10·36	1·98	2·73	18·53	1·66	0·52	0·18	5
	Oct.-Mch.	34	0·07	0·93	2·71	1·74	3·08	8·53	1·64	0·43	0·13	4
Southwark Park	Apl.-Sep.	45	0·06	3·76	7·71	4·30	3·60	19·43	3·75	0·64	0·29	5
	Oct.-Mch.	39	0·08	1·77	3·60	2·17	4·33	11·95	2·34	0·60	0·13	6
Victoria Park	Apl.-Sep.	33	0·03	0·56	1·43	1·08	1·68	4·78	1·21	0·28	0·11	6
	Oct.-Mch.	30	0·06	1·57	4·26	1·73	3·14	10·76	1·76	0·47	0·06	5
Golden Lane	Apl.-Sep.	41	0·08	2·28	4·05	1·19	3·02	10·61	1·54	0·54	0·62	6
	Oct.-Mch.	42	0·06	2·72	4·13	1·60	3·58	12·09	1·72	0·80	0·20	5
Rothamsted	Apl.-Sep.	40	—	—	0·65	0·91	1·65	3·69	—	—	—	5
	Oct.-Mch.	48	—	0·45	0·50	1·30	2·22	4·46	—	—	—	6
Malvern	Apl.-Sep.	46	Tr.	0·18	0·52	0·64	2·36	3·69	1·30	0·27	0·01	6
	Oct.-Mch.	57	Tr.	0·14	0·38	0·59	1·41	2·56	0·84	0·18	0 06	5
St. Helens	Apl.-Sep.	55	0·09	1·30	3·25	2·04	3 99	10·67	1·78	0·92	0 07	5
	Oct.-Mch.	88	0·22	2·53	4·51	0·75	8·46	16·47	1·76	1·29	0·10	6
Southport—												
Hesketh Park	Apl.-Sep.	46	0·02	0·51	1·48	0·96	3·16	6·12	1·07	0·46	0·04	6
	Oct.-Mch.	79	0·03	0·54	1·03	1·24	3·84	6·69	1·23	0·82	0·06	6
Woodvale Moss	Apl. Sep.	40	—	—	—	—	—	5·58	—	—	—	6
	Oct.-Mch.	66	—	—	—	—	—	5·10	—	—	—	6
Glasgow—												
Alexandra Park	Apl.-Sep.	46	0·05	1·27	3·13	1·42	2·67	8·53	1·50	0·41	0·10	6
	Oct.-Mch.	81	0·05	1·19	2·65	2·84	3·92	10·65	1·92	1·14	0·12	5
Bellahouston Park ...	Apl.-Sep.	45	0·08	1·49	2·43	1·05	3·17	8·26	1·45	0·26	0·06	6
	Oct.-Mch.	88	0·05	0 88	1·67	2·62	4·27	9·49	1·89	1·49	0·06	6
Blythswood Square ...	Apl.-Sep.	56	0·10	1·79	4·06	2·01	3·10	11·06	1·62	0·28	0·14	5
	Oct.-Mch.	96	0·08	1·10	2·85	3·12	4·64	11·79	2·12	1·44	0·14	5
Botanic Gardens	Apl.-Sep.	53	0·05	1·31	3·25	1·81	3·86	10·28	1·89	0·22	0·06	6
	Oct.-Mch.	97	0·07	1·30	2·52	2·97	4·68	11·54	2·49	1·13	0·12	6
Queen's Park	Apl.-Sep.	52	0·03	1·11	2·57	1·08	3·46	8·28	1·52	0·19	0·06	6
	Oct.-Mch.	101	0·06	0·76	1·62	1·86	3·45	7·74	1·72	1·15	0·08	6
Richmond Park	Apl.-Sep.	49	0 06	2·06	3·62	1·85	4·03	11·82	1·80	0·31	0·10	6
	Oct.-Mch.	102	0·09	1·42	3·65	2·76	4·54	12·47	2·28	1·22	0·33	6
Ruchill Park	Apl.-Sep.	58	0·05	1·38	3·29	1·31	3·15	9·19	1·57	0·23	0·08	6
	Oct.-Mch.	97	0·07	1·39	2·39	2·54	3·56	9·95	2·34	1·11	0·12	5
Tollcross Park	Apl.-Sep.	55	0·09	2·00	4·38	1·54	4·04	12·05	1·93	0·23	0·08	5
	Oct.-Mch.	97	0·10	1·43	3·26	2·45	4·16	11·40	2·44	1·09	0·11	6
Victoria Park...	Apl.-Sep.	54	0·04	1·21	3·15	1·77	4·01	10·18	2·29	0·23	0·11	6
	Oct.-Mch.	96	0·11	1·12	1·95	2·95	4·49	10·61	1·95	1·30	0·12	5

TABLE E.—*Summary of Table IX. Comparison of Summer and Winter Deposits for the Year April, 1919, to March, 1920.*

		Winter deposit greater in:	Deposits equal.	Summer deposits greater in:
		Stations.		Stations.
Rainfall		15	—	5
Total solids		14	—	6
Insoluble.	Tar	11	3	4
	Carbonaceous other than tar	7	—	11
	Ash	6	—	13
Soluble.	Loss on ignition	14	—	5
	Ash	17	—	2
Sulphates		12	—	6
Chlorine		15	—	3
Ammonia		11	2	5

carbonaceous matter included here covers not only soot but vegetable or animal matter which may be blown into the gauge. If this represented soot alone we should naturally expect to find a greater deposit in the winter, and this is usually the case.

Insoluble Ash.—In 6 Stations the winter deposit was the greater, while in 13 the summer was greater, the total number in this case being 19. This is what may be called a normal distribution, as the summer is the season for the production of dust.

Soluble Loss on Ignition and Ash, Sulphates, Chlorine, and Ammonia all show a very much heavier deposit during the winter than the summer. Reference to the Report for last year will show that this condition held good then also.

We may now consider the incidence of deposit during the different months of the year, for which purpose reference must be made to Table X.

It has not been possible to get the group of nine Stations during the present year for purposes of comparison with Group (*x*) of Table X. of last year, as the observations were not sufficiently continuous during the year. Only two groups are, therefore, included—i.e., Group Y for two London Stations, and Group Z for four Glasgow Stations. The two

TABLE X.—*Average Deposit of Each Element of Pollution for Each Month Reduced to a Standard of 30 Days for Group Y—2 London Stations (Meteorological Office and Finsbury Park).*

Deposit in Tons per Square Kilometre.

		1919.								1920.			Ratio Max. / Min.
		April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	
	Rainfall in mm.	78	10	34	60	60	32	15	26	88	57	14	30	8·80
	Total solids	11·69	3·98	5·97	11·00	10·73	3·94	10·30	12·18	14·17	10·05	8·20	11·06	3·60
Insoluble.	Tar	0·13	0·06	0·07	0·11	0·15	0·07	0·16	0·16	0·11	0·16	0·18	0·17	3·00
	Carbonaceous other than tar	3·22	0·49	0·77	1·70	0·85	0·44	1·28	2·29	1·99	1·97	1·76	1 89	7·32
	Ash	5·45	2·04	2·68	5·52	3·48	0·80	4·14	4·80	5·19	3·70	3·64	5·71	7·14
	Total insoluble	6·80	2·59	3·52	7·33	4·49	1·31	5·58	7·25	7·29	5·83	5·58	7·77	5 93
Soluble.	Loss on ignition	1·75	0·55	1·10	1·99	3·26	1·19	1·65	1·79	2 67	2·11	0 81	1·10	5·93
	Ash	3·15	0·85	1·35	1·68	2·98	1·44	3·08	3·15	4·21	2·11	1·81	2·19	4·95
	Total soluble	4·90	1·40	2·45	3·67	6·24	2·63	4·73	4·94	6·88	4·22	2·62	3·29	4·91
	Sulphates	1·65	0·40	0·85	1·22	1·28	0·96	1·79	1·65	2·04	1·31	0·77	0·80	5·01
	Chlorine	0·75	0·14	0·44	0·37	0·77	0·25	0·38	0·49	0·89	0·75	0·43	0·55	6·36
	Ammonia	0·11	0·01	0·04	0·08	0·10	0·05	0·06	0·06	0·13	0·06	0·03	0·03	13·00

Group Z.—4 Glasgow Stations (Bellahouston Park, Botanic Gardens, Queen's Park, Richmond Park).

Deposit in Tons per Square Kilometre.

		1919.								1920.			Ratio Max. / Min.
		April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	
	Rainfall in mm	38	12	108	17	63	57	21	101	126	121	117	88	10·5
	Total solids	12·91	7·67	12·33	7·70	8·45	8·08	5·65	13·53	12·10	12·36	9·15	8·07	2·40
Insoluble.	Tar	0·04	0·05	0·09	0·05	0·04	0·03	0·07	0·11	0·04	0·06	0·04	0·08	3·67
	Carbonaceous other than tar	2·07	1·69	1·49	1·24	1·14	1·20	1·04	1·58	1·27	1·04	0·65	0·85	3 18
	Ash	2·75	3·16	2·95	3·80	2·64	2·63	2·38	3·95	2·24	1·93	1·22	2·24	3·24
	Total insoluble	4·86	4·90	4·53	5·10	3·82	3·86	3·49	5·64	3·55	3·03	1·91	3·17	2·95
Soluble.	Loss on ignition	2·72	0·84	1·53	0·75	1·45	1·31	0·54	2·70	2·29	3·93	3·05	2·58	7·27
	Ash	4·89	1·93	6·30	1·89	3·42	3·10	1·63	5·20	6·26	5·45	4·18	2·31	3·86
	Total soluble	7·61	2·77	7·83	2·64	4·87	4·41	2·17	7·90	8·55	9·38	7·23	4·89	4·32
	Sulphates	1·79	0·74	2·90	0·99	1·60	1·88	0·78	3·19	2·46	2·90	1·86	1·18	4·32
	Chlorine	0·31	0·16	0·28	0·25	0·17	0·27	0·10	0·67	1·73	2·76	1·25	0·82	27·6
	Ammonia	0·09	0·04	0·20	0·04	0·06	0·01	0·04	0·15	0·35	0·13	0·09	0·11	35·0

TABLE F.—*Analysis of Table X. showing Months of Highest and Lowest Deposit for Each Element of Pollution.*

		(Y) 2 London Stations.				(Z) 5 Glasgow Stations.			
		Highest.	Second highest.	Lowest.	Second lowest.	Highest.	Second highest.	Lowest.	Second lowest.
	Rainfall	Dec.	April.	May.	Feb.	Dec.	Jan.	May.	July.
	Total solids	,,	Nov.	Sept.	May.	Nov.	April.	Oct.	May.
Insoluble.	Tar	Feb.	March.	May.	June & Sept.	,,	June.	Sept.	April, Aug., Dec., & Feb.
Insoluble.	Carbonaceous other than tar	April.	Nov.	Sept.	May.	April.	May.	Feb.	March.
Insoluble.	Ash	March.	July.	,,	,,	Nov.	July.	,,	Jan.
	Total insoluble	,,	,,	,,	,,	,,	,,	,,	,,
Soluble.	Loss on ignition	Aug.	Dec.	May.	Feb.	Jan.	Feb.	Oct.	July.
Soluble.	Ash	Dec.	April & Nov.	,,	June.	June.	Dec.	,,	May.
	Total soluble	,,	Aug.	,,	,,	Jan.	,,	,,	July.
	Sulphates	,,	Oct.	,,	Feb.	Nov.	June & Jan.	May.	Oct.
	Chlorine	,,	Aug.	,,	Sept.	Jan.	Dec.	Oct.	May.
	Ammonia	,,	April.	,,	Feb. & March.	Dec.	Nov.	Sept.	May, July, & Oct.

London Stations used being the Meteorological Office and Finsbury Park, the four Glasgow Stations being Bellahouston Park, Botanic Gardens, Queen's Park, and Richmond Park.

It is to be noted that, in preparing this table, any Station missing a month has to be omitted, as it might compromise the results; hence the necessity for reducing the number of Stations included to the above groups.

Table X. has been further analysed, as shown in Table F. In this the months of highest and lowest deposit for each element of pollution have been tabulated. Considering now each element of deposit separately, we get the following results:—

Rainfall.—In both Groups Y and Z the highest rainfall was in December, and the lowest in May.

Total Solids.—In Group Y the highest deposit occurred in December, the lowest in September, while in Group Z the highest was in November and the lowest in October. It will thus be noted that out of the four cases in only one does the highest total solids deposited coincide with the highest rainfall.

Tar.—The highest deposit of tar in the London Group was in February, the lowest in May; while in the Glasgow Group the highest was in November and the lowest in September. This may be regarded as a normal distribution, as the winter months, including the two highest deposits, are the time when domestic fires are in operation, while the lowest deposits occurring in May and September are in the summer months when fires are presumably not required. It is curious, however, to notice that in the Glasgow Group there is a second minimum in December and February. Wind, doubtless, has a great influence on the quantity of deposit, high winds sweeping it away from the vicinity of its origin and calm weather favouring deposit near the source of the impurity.

Insoluble Carbonaceous.—In both the Y and Z Groups the highest deposit occurred in April, while the lowest in London was September and in Glasgow February. This is a somewhat anomalous result, but may possibly be explainable by an excessive deposit of vegetable or animal matter blown into the gauges in the summer months. There is, however, a second maximum in London in the month of November, while a second maximum in Glasgow occurs in May.

Insoluble Ash.—The highest deposit in the London Group was in March, the lowest in September. In the Glasgow Group the highest was in November, the lowest February. There were in both cases second maxima in July.

Soluble Loss on Ignition.—The highest deposit occurred in London in August and the lowest in May, while in Glasgow the highest was in January and the lowest in October. Second maxima occurred in London in December and Glasgow in February.

Soluble Ash.—The highest deposit in London was in December, the lowest in May, while in Glasgow the highest was in June, the lowest in October.

Sulphates, Chlorine, and Ammonia all made their maximum deposit in London in December and their minimum in May. In Glasgow the maximum deposit of Sulphates was in November, the minimum in May. The highest deposit of Chlorine was in January and the lowest in October, while the highest deposit of Ammonia was in December, the lowest in September.

Relation of Deposits.—The general relation of the amount of the different elements of pollution to each other has been brought out fully in the previous Reports, and particularly the relation between rainfall and soluble deposit. The absence of a continuous record for a sufficient group of Stations has made it useless to include curves on the lines of the last Report, but Tables III. and IV. can be used to examine the relation of the deposits with each other for the individual Stations.

RESEARCH WORK.

The chief problem which has engaged the attention of the Committee has been the measurement of acidity in the air, in continuation of the work described in the Report for last year. A large amount of experimental work has been done and some advance has been made, particularly in the design of a sensitive instrument for measuring acidity in the air. Serious difficulties were, however, encountered in connexion with the determination of acidity in the suspended impurities of the air. These difficulties arose mainly from the colouring matter introduced into the tintometer in the form of suspended impurities, and they will be described in detail further on.

Automatic Filter.

The automatic filter which was described in the Fourth Report of the Committee has been completed, and eight instruments have been constructed. Two of these are experimental instruments and six are for distribution to Observing Stations.

Reference to the Fourth Report will indicate the general construction of the filter, which has now been made to take 24-hour record discs, as these were found much more convenient than 12-hour discs. Many records have been taken of the impurities in London air and some interesting results obtained. It has been shown, for example, that there is a definite cycle in the distribution of the impurities throughout the 24 hours. Usually from about midnight to 6 A.M. the air is practically clear of impurity, very little being recorded except during the prevalence of fogs in winter. At about 6 o'clock A.M., when people light their fires, the impurity commences to increase in quantity and continues to do so until about 11 A.M. From 11 A.M. till about 10 P.M. the quantity varies very little from hour to hour, but at 10 P.M. it rapidly begins to diminish and has almost disappeared by midnight. This appears to be the normal distribution in the absence of special disturbing factors, such as fogs. When there is a fog this distribution is disturbed, but even during the thickest fog there is a tendency to clear between midnight and 6 A.M.

It is hoped that this filter may be found of use for comparing the relative amounts of impurity in the air at different parts of a city simultaneously. Very often it is necessary to answer the question, Is the air in a particular district more impure than in another, and it is not easy to do so without some such instrument as the present one. By the aid of two such filters set up simultaneously at two different points of a city it is quite possible to compare the degree of purity of the air at the two points.

Similarly the air over different cities may be compared if simultaneous records are kept. Again, as already indicated above, the degree of pollution of the air at different times of day may be found, and from this an indication may be obtained as to the source of the impurities. Records may be kept of the intensity of fogs and their duration, as well as their method of growth and decay.

Another use for this instrument should be found in examining the efficiency of the filtration plants installed in connexion with ventilation on the Plenum system or any system which aims at removing impurities in the air before it is allowed to enter a building. It is a simple matter to take simultaneous observations inside and outside of such a building, and thus to observe whether or no the means adopted for purifying the air are having the desired effect.

The Committee are now able to supply the instruments to such authorities as may desire to take observations. As already stated, there are six available at the moment for distribution, and others can be constructed in about two months. The instruments can be sold at £36 6s., which includes the usual charge for departmental expenses.

Use of Rain Gauge for Measuring Deposit.

The Committee have had under consideration the possibility of using the standard rain gauge for measuring deposit. It would obviously be of great advantage if a small standard instrument, which is already in use, could be made to give the necessary information, especially if the existing organisation for measuring rain could be utilised for measuring deposit.

It appeared obvious, however, that a small rain gauge, say 5 in. or 8 in. diameter, could hardly give sufficient quantity of deposit to enable an analysis to be made; therefore a simplification of the method was considered under the following heads:—

(*a*) To aim at measuring total solids only.
(*b*) To divide the total deposits into soluble and insoluble, with, possibly,
(*c*) A division into combustible and incombustible.

The adoption of such a simplified method might enable the Committee to obtain a large increase in the number of Stations providing data, but such data would not be as valuable as that obtained at present. One of the difficulties in connexion with utilising the standard rain gauge of either 5 in. or 8 in. diameter arises from its small area, and consequently the small amount of deposit which would be caught.

The standard rain gauge of 5 in. diameter has an area of 0·135 sq. ft., or $\frac{1}{29·6}$ of the area of the standard deposit gauge. The 8 in. gauge has an area of 0·35 sq. ft., or $\frac{1}{11·4}$ of that of the standard deposit gauge.

If we assume a possible error in weighing, &c., of plus or minus 1 mg., and a permissible total error in the estimate of, say, 10 per cent., then the minimum quantity of deposit to be estimated must not fall below 10 mg., or 0·01 gramme, which represents a deposit of 0·8 ton per square kilometre if in the 5 in. gauge, or 0·3 if in the 8 in. gauge.

Referring now to Table II., which gives the deposit of total solids, any deposit recorded by the standard gauge which is over 0·8 will fall within the range of the 5 in. gauge, and any figure over 0·3 would be recorded by the 8 in. gauge. Thus an idea may be obtained of the extent to which the 5 in. or 8 in. gauge might be substituted for the present deposit gauge without introducing too great an error. Speaking generally, if only total solids are measured, or even if the deposit is divided into soluble and insoluble, the small 5 in. rain gauge would give sufficient deposit to be estimated in nearly all cases. It is probable, however, that country Stations giving a small deposit would not provide sufficient for estimation either from the 5 in. or 8 in. rain gauge.

One great objection to the use of the standard rain gauges is the impossibility of estimating the quantity of tar and sulphates present in the deposit, as these elements provide an indication of the origin of the deposit.

To investigate this matter, however, the Committee had the water collected in the 8 in. rain gauge on the roof of the Meteorological Office analysed for two or three months. During the month of November the small 8 in. rain gauge collected 900 c.c. of water, the total deposit was 0·445 gramme, the total soluble 0·34 gramme, while in the standard deposit gauge the water collected was 783 litres, total deposit 1·962 grammes, total soluble 0·53 gramme. There was, therefore, a large excess of soluble matter in the water collected in the rain gauge. The same result was found in subsequent months, and it was ascertained that the excess of soluble matter was due to metal dissolved from the rain gauge.

It was therefore useless to continue the experiment unless the solution of the metal could be prevented. In order to do this the rain gauge was given a coating of Duroprene varnish, in the hope that this would prevent the solution of the metal without any contamination of the water.

The results of the analysis of a month's rainfall showed for the 8 in. rain gauge a considerably larger proportion of soluble and insoluble matter per litre of water as compared with the standard deposit gauge, owing to the varnish yielding to the action of the rain water. It is therefore clear that if observations are to be taken with small gauges these must be constructed of something which will not dissolve in the water, and the use of the ordinary copper rain gauges is therefore inadmissible.

The Committee are indebted to THE LANCET Laboratory for making the analyses of the water collected both in the rain gauge and in the standard deposit gauge, and the above results are based on Mr. S. A. Vasey's report of these analyses.

The following notes have been kindly sent by Dr. J. R. Ashworth, of Rochdale, describing some experiments he made with a 5 in. rain gauge for measuring deposit:—

"In January of this year a 5 in. rain gauge was placed side by side with the standard gauge with the object of testing if such a gauge might be used as a measurer of atmospheric pollution. The 5 in. gauge was provided with the usual funnel and drained into a Winchester glass bottle. The metal funnel was coated with a double layer of 'Duroprene' to prevent corrosion of the metal. The rain and all that fell into the gauge was collected once a month.

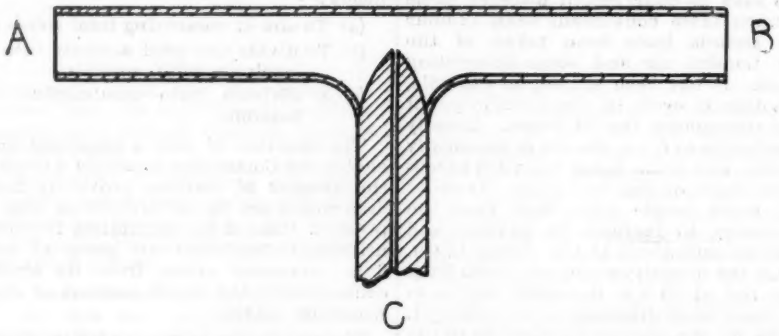
The following are the results obtained:—

	Standard.		5 in. gauge.		Park 8 in. gauge.
	Metric tons per square kilometre.	Rain (in.).	Metric tons per square kilometre.	Rain (in.).	Inches.
January ...	26·50	4·76	22·0	5·15	5·52
February ...	26·34	4·22	17·2	4·24	4·52
March ...	35·34	3·58	23·2	3·89	4·09
April	26·93	5·07	18·1	5·36	5·90
May and June ...	83·03	5·44	68·5	8·36	8·89
Total ...	198·14	23·07	149·0	26·96	28·92

$$\text{Ratio } \frac{\text{5 in. gauge}}{\text{Standard}} = \frac{149}{198} = 0{\cdot}75.$$

"It will be noticed that the rain caught by the 5 in. gauge exceeds that caught by the standard gauge, and the reason for this is that a good deal of loss by evaporation goes on from the large surface of water exposed in the standard gauge.

FIG. 1.—*Apparatus for Calibrating the Original Tintometer.*



which was corked up so that the rain collected in it. The amount of rain caught by the 5 in. gauge compares favourably with that at the Park, which is close at hand, remembering that the 5 in. gauge is emptied once a month only, while the Park gauge is emptied every day, and thus the loss by evaporation from the Park gauge would be less than from the 5 in. gauge. From this it may be concluded that the 5 in. gauge registers rain correctly. Why does it not collect properly the solid impurities in the air? The answer in all probability is that the impurities which fall on the funnel must, in dry weather, be swept out by the winds. To test this view a glass vessel 7·7 in. in diameter was exposed beside the standard gauge in the month of April. It had no funnel, so that all the impurities which were deposited were collected at once in the rain water in the gauge. This vessel caught 29·06 metric tons per square kilometre, which is not very different from the 26·93 metric tons obtained by the standard gauge, in contrast with the 18·1 metric tons found by the 5 in. *funnel* gauge. The rain caught by all three gauges was nearly the same in this month. It is evident, therefore, that ordinary shallow *funnel* rain gauges are not suitable for absolute measurements of atmospheric pollution. This raises the question whether the standard gauge should be allowed to become dry by letting the water drain into bottles, for it seems possible that a small part of the dry dirt in the gauge may be blown out in high winds."

Measurement of Acidity.

The experimental work on the measurement of acidity which was described in the Report for last year has been continued.

The Committee has, however, been unfortunate in losing, temporarily, the services of Mr. G. M. Watson, owing to illness, and work has therefore been carried on by Mr. A. H. Maud, F.I.C., and later by Mr. E. W. Bolton. At the time of going to press Mr. Watson has been able to resume his work.

The following part of the Report has been arranged in separate sections under the names of the gentlemen responsible for the particular part of the work described.

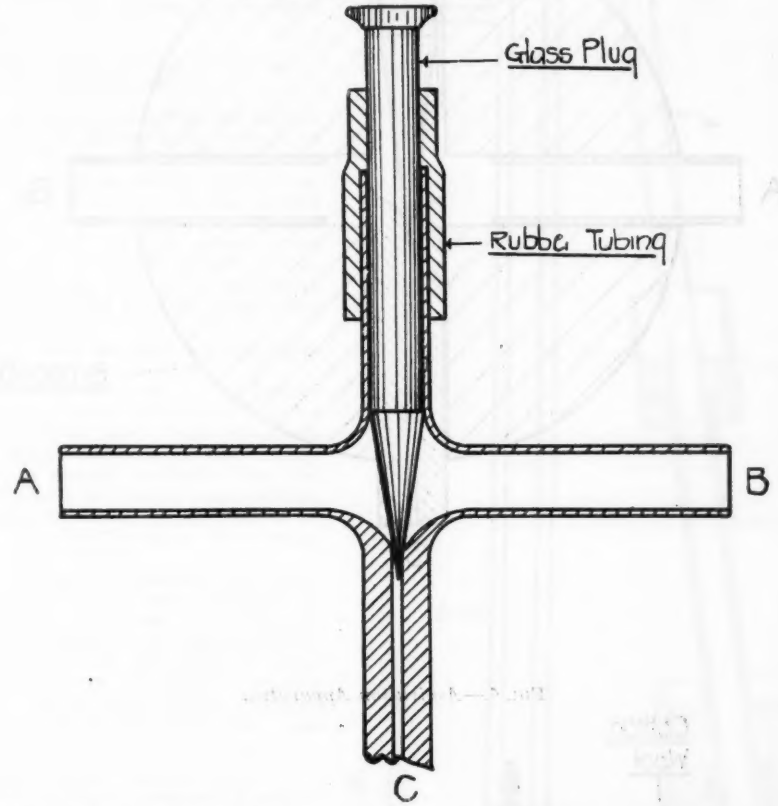
WORK CONTINUED BY MR. WATSON.

Calibration of the Tintometer.—A great deal of time has been spent upon the attempted calibration of the tintometer described in the last Report (p. xxv.). In theory the method attempted was very simple, but it had finally to be abandoned because no concordant results could be obtained. Several possible causes of failure were located, but experimental difficulties were too great to overcome them.

The first apparatus made is shown in Fig. 1. A piece of capillary tubing, C, was drawn out into a very fine jet and calibrated. It was then sealed into the tube AB, which was connected to the absorption tube of the tintometer. The capillary tube was filled with sulphur dioxide which could be driven out by means of mercury into a current of air passing through AB and into the tintometer. The volume of air was measured by a gas meter and the flow of SO_2 by a travelling microscope. The method was found to be useless owing to diffusion of the SO_2 before the pressure of mercury was applied.

The next method tried was an arrangement by which the end of the capillary tube could be opened and closed at will. This device is shown in Fig. 2 and consisted of a glass plug drawn out to a fine tip which was ground into the mouth of the capillary tube. Difficulty was experienced with this also, for though the capillary tube could easily be fused in position, it always cracked when grinding was attempted. Finally a brass apparatus was used for this junction (Fig. 3), and the glass tubes were fixed in position with sealing-wax. It was found necessary to apply a little vaseline to the point of the plug to prevent leakage.

FIG. 2.—*Improved Apparatus.*



The procedure was as follows. A stream of air, purified by passing through two soda-lime tubes, was drawn through the wide tube, AB (Fig. 3), which was connected to a bottle to ensure that the SO_2 was properly mixed with a large volume of air. The bottle was connected to the tintometer absorption tube through which the mixture bubbled. The apparatus is shown in Fig. 4. It was found repeatedly that if small equal increments of acid were added one after the other and the results plotted on a graph, the curve between the volume of SO_2 added and the colour change produced in

FIG. 3.—*The Latest Design.*

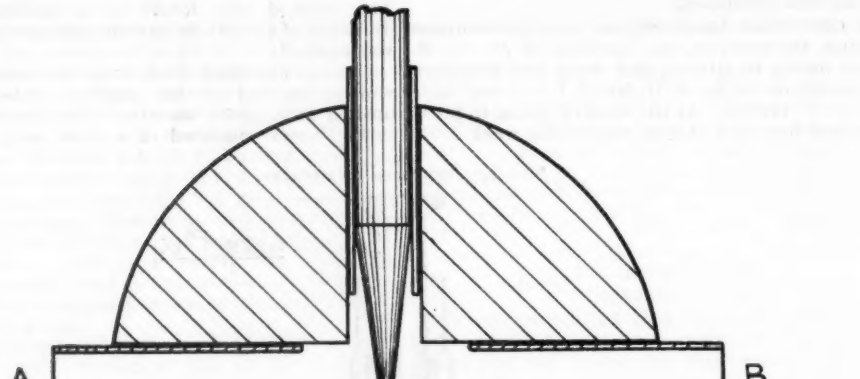
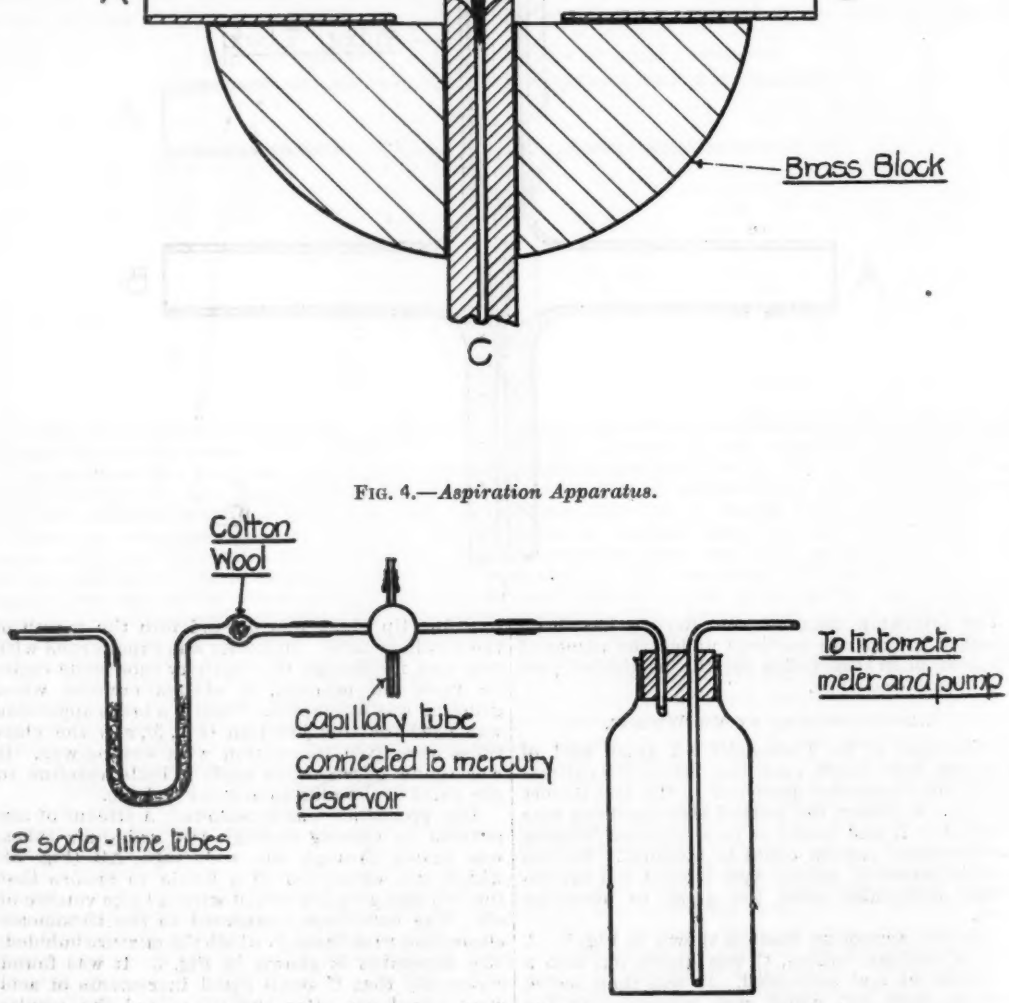


FIG. 4.—*Aspiration Apparatus.*



the methyl-orange was a straight line. The slope of this line could not be confirmed by addition of a single large amount of acid, for in every case the effect was much greater than was predicted from the graph above mentioned. The results showed no kind of regularity whatever.

This was explained by assuming that every time some of the SO_3 was lost in the apparatus. It was found that vaseline and sealing-wax are both attacked by SO_3. The difficulty lay in the fact that if the most minute trace of acid were lost the results were useless. For this reason the method was abandoned.

Experimental Work Carried Out by Mr. A. H. Maude.

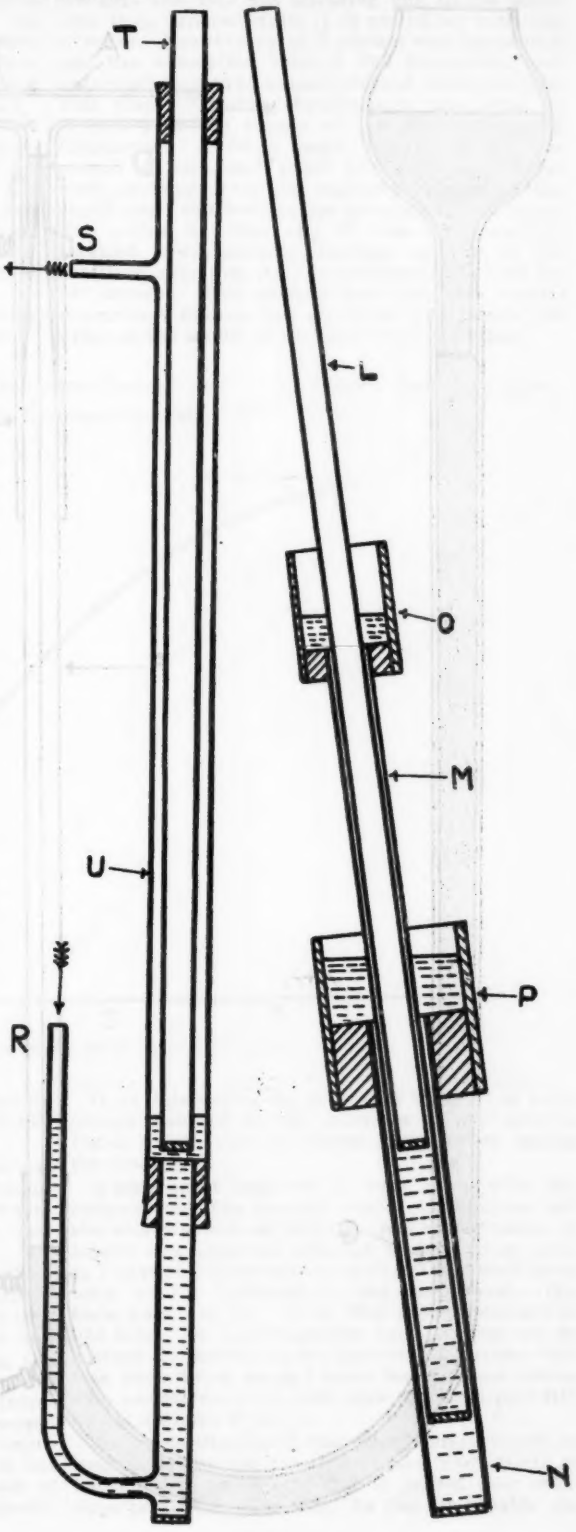
The tintometer described in the last Report was standardised by adding drops of acid of known strength. In doing this work, however, several improvements suggested themselves. The concave surface of the liquids caused the field to be non-uniform; it was difficult to compare the tints for this reason; also because, when the level was raised in the compensating tube, the surface of the liquid came much nearer to the eye than that of the liquid in the absorption tube.

To eliminate these troubles an apparatus was evolved as shown in Fig. 5.

At first an attempt was made to standardise this apparatus with weak mixtures of SO_2 and air; but this method gave very uncertain results, the mixture apparently losing acidity on standing. It seemed probable that the SO_2 either oxidised to SO_3 or decomposed, depositing sulphur owing to the action of light. That this decomposition does occur has been proved by Tyndall.

The next attempt to standardise was made with H_2SO_4 fumes, a very small quantity of dilute acid being volatilised in a current of air. Again the results were unsatisfactory. It was observed in this case that if about 0·3 mg. of H_2SO_4 was volatilised a visible cloud formed, which after passing through the absorption tube of the tintometer was

FIG. 5.—*The Comparative Tintometer.*



Description of Large Tintometer, Fig. 5.

The tintometer is in two parts—the absorption tube and the comparison tube.

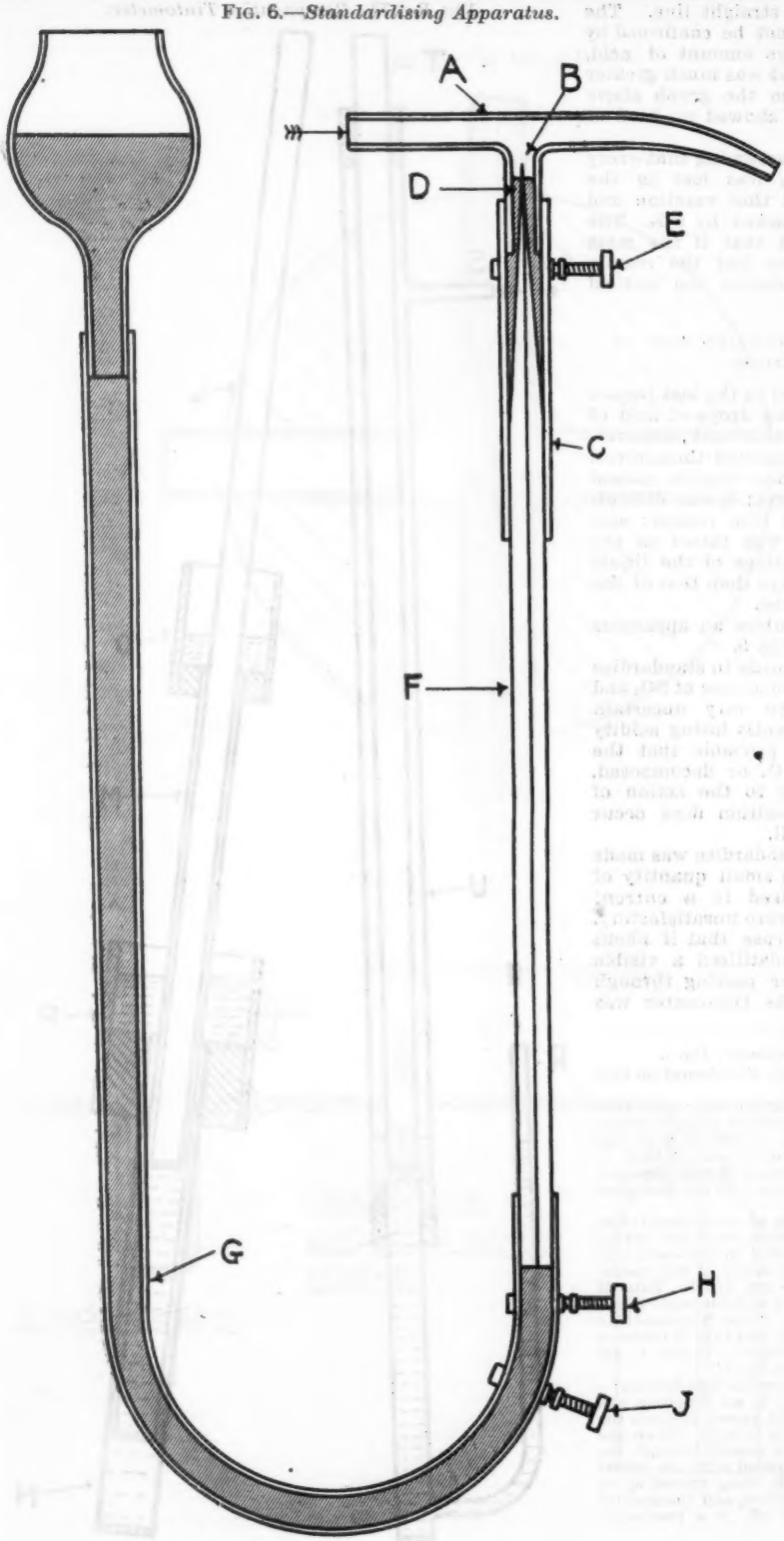
The absorption tube consists of an outer glass tube U containing an indicator solution of methyl-orange, and an inner tube T, which is held in a central position by a rubber stopper in the end of tube U. These tubes have glass discs ground in and cemented in their lower ends, the distance between the glass discs being 12·5 cm.

The comparison tube consists of three glass tubes, L, M, and N, one inside the other, each one having a glass disc ground and cemented in the lower end. Tubes L and N are fixed to the casing of the instrument with the glass discs 12·6 cm. apart. Tube M can be moved up or down and a suitable scale shows the amount of the movement. Tube N contains an alkaline solution of the indicator, and tube M contains an acid solution of the indicator. O and P are reservoirs to contain any surplus liquid.

The method of using the instrument is as follows:—

The outlet S is connected up to an air-pump and meter, air is drawn in at R and passes through the solution of indicator contained in tube U. When the correct quantity of air has been passed through the colour of the indicator is compared with the colour in the comparison tube, tube M being moved up or down until the colours are matched, and the amount of acidity in the air is read off on a previously calibrated scale.

FIG. 6.—*Standardising Apparatus.*



still visible. This clearly demonstrates that H_2SO_4 fumes are not absorbed, or only so to a slight extent, on bubbling through the liquid. This is what might have been expected, assuming the H_2SO_4 fumes to contain no gaseous acid, for it has been previously demonstrated that dust particles are not removed from air by bubbling through water.

The next attempt to standardise was by means of volatilising weak HCl in a similar way. Though satisfactory results were eventually obtained by this method, difficulty was experienced owing to the water in the weak acid condensing in the colder parts of the tube and having to be re-evaporated. It was, therefore, thought advisable to standardise with gas without the admixture of water. Since hydrochloric acid acts on mercury in the presence of air, a mixture of HCl and air could not be handled over mercury. The standardisation, was, however, carried out effectively by means of a capillary tube arrangement mounted in the manner shown in Fig. 6. The results were, as was to be expected, identical with those obtained by standardisation by addition of drops of standard acid. It was found that 0·32 mg. of HCl produced 100 per cent. colour change when HCl gas was used. and 0·41 mg. H_2SO_4 when a weak solution was used—the theoretical quantity necessary would be 0·43 mg.

The colour change of methyl-orange may be rendered very much more marked if indigo-carmine be added,[2] but this solution if saturated with CO_2 shows a colour change. If, however, air containing, CO_2 is passed through the liquid no colour change takes place, as the liquid in

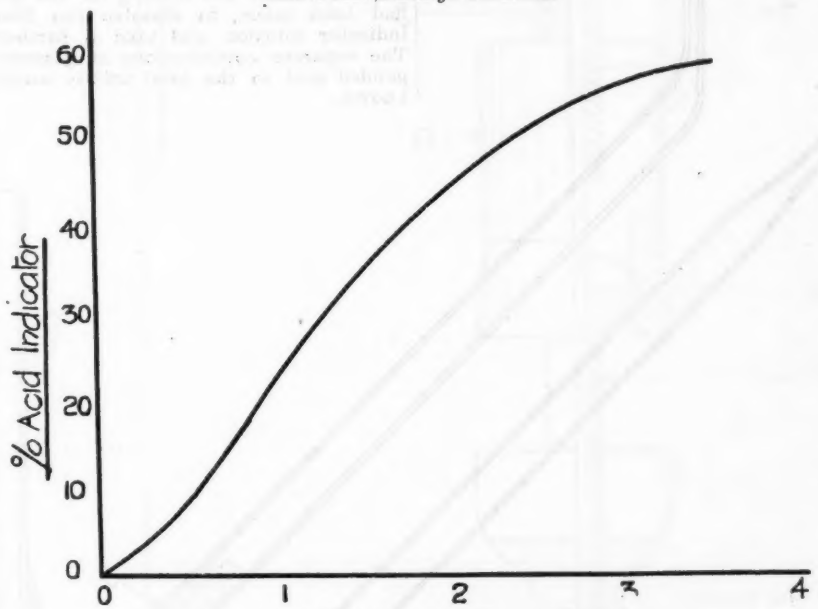
[2] Chem. Zeit., xxxi., 1172.

this case does not approach saturation. This liquid was, therefore, tried in the tintometer and the colour change was very much more distinct, especially the first part of the change. The colour alters from green through grey to purple, and the rate of change through the grey is most marked.

The instrument was standardised with this indicator with results as shown on the accompanying Chart, Fig. 7. Full instructions are given for the use of this instrument below as worked out by numerous experiments. The instrument was repeatedly tried out on the air outside the Laboratory, but on one occasion only was acidity indicated, the quantity being 0·16 mg. acidity expressed as HCl per cubic metre.

The methyl-orange used was put up by Grubler, and the indigo-carmine by Hopkins and Williams.

FIG. 7.—*Standardisation Curve for Large Tintometer Charged with 7·5 c.c. 0·000?% Methyl Orange and 0·000?% Indigo Carmine.*



In spite of the fact that the instrument is capable of detecting one part of HCl by volume in 10,000,000 of air, it is not sufficiently sensitive.

For this reason a smaller-sized instrument was designed with a view to using a very much smaller quantity of indicator solution. This is shown in Figs. 8 and 9, and proved to be so sensitive that standardisation was a very difficult matter.

The method adopted was to use a standardised apparatus, as shown in Fig. 6. The capillary tube F and the rubber tube G were filled with mercury. Some HCl gas was collected in a nitrometer and passed into the capillary tube F, displacing the mercury; the clip J was closed, the rubber tube C with the T-tube A were attached, mercury introduced into D, and the clip E closed till it caused the mercury to rise above the tip of the capillary B. This manipulation could be carried out without risk owing to the very small diameter of the drawn-out capillary tube, which practically prevents the HCl gas diffusing out in the short time it is exposed, until it is sealed up with the mercury. Next the tip of T-piece A was introduced into the absorption tube of the tintometer, and connected thereto by a small piece of rubber tubing. This piece of rubber tubing does not come in contact with the stream of air passing into the tintometer. A fairly rapid stream of air was caused to pass, and small quantities of HCl gas were expelled from the capillary by opening the clip E until the level of the mercury, D, fell below the orifice B. The clip H was very carefully screwed down, causing mercury to rise in the capillary, expelling its own volume of HCl into the air current. This method does not give exactly concordant figures, but no doubt will enable the order of the acidity of the air to be determined.

It is interesting to note that the HCl is completely absorbed in the moisture on the tube L, Fig. 8, which must be rinsed down before taking the reading.

A number of tests of air were made with the instrument. The weather was, however, clear and the wind westerly all the time and no indication of acidity was observed, although an amount as small as 1 part of HCl by volume in 20,000,000 would have been readily indicated by the instrument. The tests were run on 1 cubic foot passed through in one hour. Of course, greater sensitiveness can be secured by increasing the quantity of air, and this was done twice, using 5 cubic feet in four hours. The sensitiveness in this case exceeds 1 part HCl in 100 millions of air.

In standardisation it was found impracticable to neutralise the air, for if it passed over H_2SO_4 it became perceptibly acid and if passed over soda-lime perceptibly alkaline. As the air outside the

building was neutral, this could be used conveniently, although, of course, each time a test had to be made to ensure that it was neutral.

Owing to the loss of Mr. Maude's services arising from his departure to take up work in Canada the research has been continued by Mr. E. W. Bolton, and the following is a description of the experiments carried out by him.

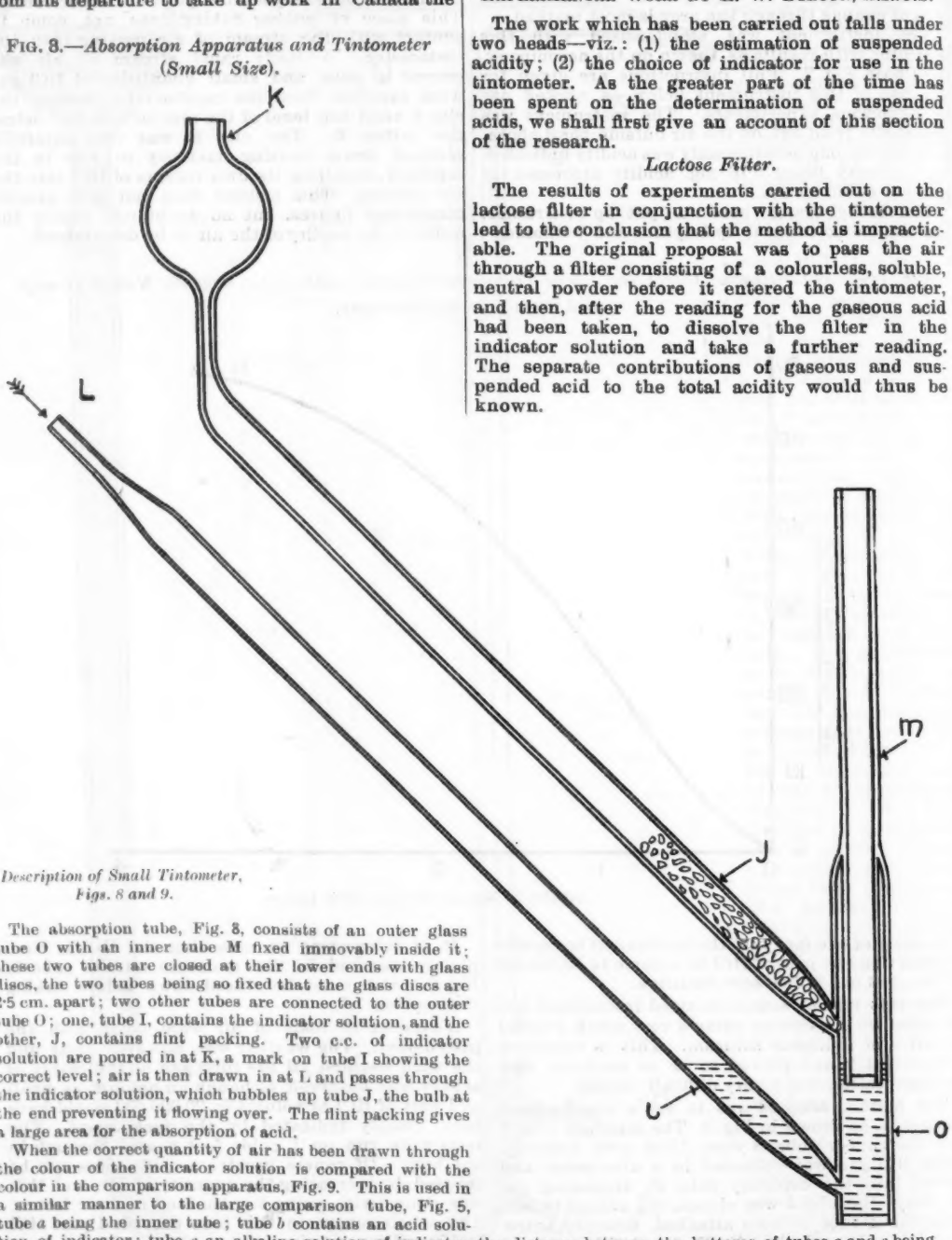
EXPERIMENTAL WORK BY E. W. BOLTON, A.R.C.S.

The work which has been carried out falls under two heads—viz.: (1) the estimation of suspended acidity; (2) the choice of indicator for use in the tintometer. As the greater part of the time has been spent on the determination of suspended acids, we shall first give an account of this section of the research.

Lactose Filter.

The results of experiments carried out on the lactose filter in conjunction with the tintometer lead to the conclusion that the method is impracticable. The original proposal was to pass the air through a filter consisting of a colourless, soluble, neutral powder before it entered the tintometer, and then, after the reading for the gaseous acid had been taken, to dissolve the filter in the indicator solution and take a further reading. The separate contributions of gaseous and suspended acid to the total acidity would thus be known.

FIG. 8.—*Absorption Apparatus and Tintometer (Small Size).*



Description of Small Tintometer, Figs. 8 and 9.

The absorption tube, Fig. 8, consists of an outer glass tube O with an inner tube M fixed immovably inside it; these two tubes are closed at their lower ends with glass discs, the two tubes being so fixed that the glass discs are 2·5 cm. apart; two other tubes are connected to the outer tube O; one, tube I, contains the indicator solution, and the other, J, contains flint packing. Two c.c. of indicator solution are poured in at K, a mark on tube I showing the correct level; air is then drawn in at L and passes through the indicator solution, which bubbles up tube J, the bulb at the end preventing it flowing over. The flint packing gives a large area for the absorption of acid.

When the correct quantity of air has been drawn through the colour of the indicator solution is compared with the colour in the comparison apparatus, Fig. 9. This is used in a similar manner to the large comparison tube, Fig. 5, tube *a* being the inner tube; tube *b* contains an acid solution of indicator; tube *c* an alkaline solution of indicator, the distance between the bottoms of tubes *a* and *c* being 2·5 cm.; tube *b* is held by a cork, *d*, fixed in a short piece of brass tube, *n*, with a nut revolving on a screw, *e*. Tube *b* may thus be raised or lowered by turning the brass tube *n*. The amount of movement is shown on a scale *f*, each division being equal to one revolution of the nut, and decimals of a revolution being shown by marks on the brass tube *n*. *g* is the wooden base of the instrument, and *h* is a metal bracket for supporting the screw *e*, to which is fixed the inner tube *a*.

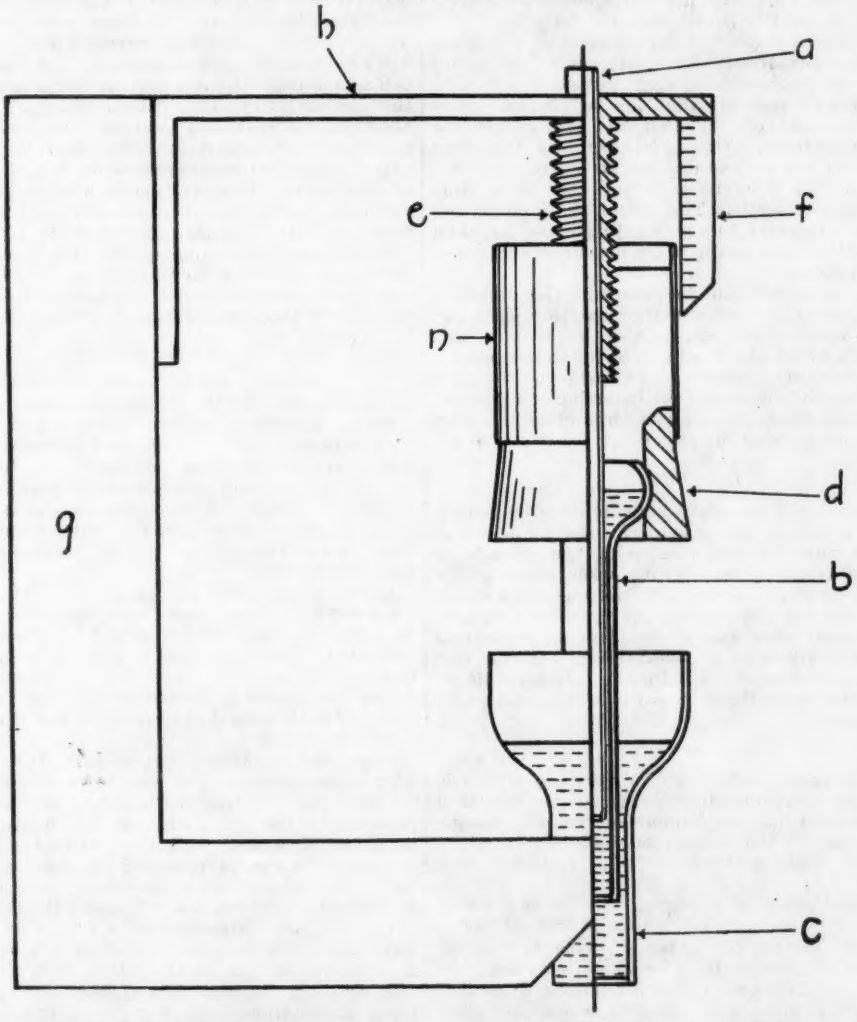
Some preliminary work had been done by Mr. Watson. Lactose was chosen as the filtering medium as it fulfilled the conditions of neutrality and solubility; it was also colourless and could further be dried at a temperature above 100° C. without decomposition or discoloration. He was able to show that the amount of gaseous acid trapped by the lactose was inappreciable, but he found that, though the lactose alone had very little effect on the colour of the indicator when dissolved in it, the lactose and dust together had a marked influence, causing the colour to become darker.

A similar filter-tube to that employed by Mr. Watson was constructed, and a number of filtrations were carried out, using 0·2 gm. lactose in each case, and passing different volumes of air. On the basis of Mr. Maude's calibration of the indicator with HCl gas, and assuming 100 cubic feet of air to contain 0·12 mg. of soot, and that the dust collected consists entirely of soot containing 5 per cent. of free sulphuric acid (Rideal), it should be necessary to pass at least 140 cubic feet of air in order to obtain 100 per cent. colour change. The filter, together with the dust which had been trapped, was dissolved in 2 c.c. of the indicator contained in the tintometer, and an attempt was made to determine the reading. In every case, however, there was so marked a darkening and discoloration of the indicator that the colour could not be matched. It would seem, therefore, that some portion of the dust itself dissolves in the water or else remains in fine suspension. Elimination of this colour effect was attempted.

Filtration of the liquid was tried, but the alkalinity of the filter paper used was sufficient immediately to turn the indicator a strong alkaline green.

A filter (lactose and dust) was shaken with distilled water, the more closely to observe the exact nature of the discoloration. The solution had a distinct brownish tint. This was filtered twice and allowed to stand overnight. The colour, however, still persisted after this treatment. Another filter was shaken with water and rotated on a

FIG. 9.—*Comparison Apparatus (Small Size).*



centrifuge; this also failed to remove the colouring matter, which is thus clearly not due to suspended particles, but to actual or colloidal solution.

Treatment with pure animal charcoal was next tried. It was found that charcoal certainly reduced the colour if it did not entirely remove it. There are, however, certain objections to the use of charcoal as a decoloriser—namely: (1) It would be necessary to treat the solution with charcoal and remove the same before adding the indicator; (2) possibility of adsorption of some of the acid by the charcoal. A series of experiments was carried out with dilute HCl solutions to test this last point, and the results showed clearly that acid was taken up by the charcoal. This effectually rules out charcoal as a decolorising agent.

It appeared possible that the lactose had some solvent influence on the dust, and thus caused the brown coloration. Glass powder was therefore substituted for lactose and an air current passed. The filter was shaken with indicator in a tube and allowed to settle. The liquid was then poured into the tintometer, but no reading could be taken as the colour was again much obscured and could not be matched.

Attempts were made to overcome the difficulty by compensation with a similar solution placed in the eye-piece of the colorimeter, but trouble was experienced with the meniscus owing to the narrow bore of the tube. Waxing the inside of the tube failed to remedy this, and the insertion of a plunger to eliminate the meniscus was impracticable owing to the small scale of the apparatus.

Disc Filter.

The possibility was then considered of collecting the dust on a dry disc of paper, tinted by means of indicator solution, and comparing the change of colour obtained on moistening with water with a standard series of colours. At present the method has not yielded any satisfactory results owing to the inherent alkalinity of the filtering paper and consequent difficulty of obtaining a definite tint with a known amount of indicator. Another likely source of error would seem to be uneven adsorption by the paper.

Conductivity.

The apparent breakdown of the colorimetric method for suspended impurities led me to search for a method not dependent on colour change. The suggestion that electrical conductivity might hold some possibilities in this direction was examined.

When a solution of a strong base is added to a solution of a strong acid there is first of all a diminution of the conductance owing to the replacement of hydrion by a less mobile cation; but when all the hydrion has been removed, by combination with hydroxidion from the base added, then any further addition of base will cause the conductance to increase owing to the addition to the solution of free hydroxidion. Since the OH_1 ion is a highly mobile ion, the presence of a slight excess of free alkali will cause a marked increase in the conductance.

It was therefore proposed to dissolve out the acid and soluble salts contained in the dust collected on a filter by means of water of known conductivity, determine the conductivity of the solution, and finally add standard alkali drop by drop until the point of minimum conductivity was attained. The assumption was made that the conductivity of the dissolved salts remained unchanged during the operation.

The chief difficulty experienced was the provision of a suitable filtering medium—that is, one which should be free from electrolytes, and therefore have no influence on the conductivity. All the materials tried, however, which included cotton wool, glass wool, glass powder, and lactose, were found to affect the conductivity to a greater or less degree, the most favourable for the purpose being the last named. Several blank experiments were run with equal weights (0·2 g.) lactose to determine its approximate contribution to the conductivity. Air was then filtered through a layer of 0·2 g. lactose, the whole placed in a conductivity cell and stirred till the lactose had dissolved, and the conductivity determined. It was found on addition of standard potash that a point of minimum conductivity was obtained. As, however, this diminution corresponded to but 8 per cent. of the total conductivity (allowing for the conductivity of the water itself and that due to the sugar) it is obvious that any errors of method and manipulation will be magnified considerably in the final value obtained for the acidity. To this objection must also be added the serious disadvantage that the method is essentially a laboratory one.

Congo-red.

The question of the most suitable indicator solution to use in the tintometer was considered. That at present in use is made up of standard solutions of methyl-orange and indigo-carmine in equal proportions. The main factor which governed the choice of methyl-orange was its insensitiveness to carbon dioxide. Indigo-carmine was later introduced as the mixture gives a better colour change than methyl-orange alone, without also being sensitive to CO_2.

It was suggested that though from this point of view methyl-orange was a very desirable indicator for our purpose, yet it might be that another indicator would possess a greater sensitiveness towards the very small amounts of acid which have to be estimated. Instructions were therefore received to investigate the possibilities of congo-red in this direction.

Congo-red is known to be sensitive to CO_2 in high concentrations. It was desired to determine whether the indicator is affected by such small proportions of the gas as are found in ordinary air. In order to achieve this the CO_2 and other acids present in air were removed by passing some air through Winkler tubes containing potash solution and a long tube packed with soda-lime. 2 c.c. of CO_2 were then injected into a 6-litre bottle containing purified air, thus obtaining a concentration of 0·03 per cent. CO_2. The mixture of air and CO_2 was bubbled through the tintometer absorption tube containing 2 c.c. of Congo-red solution (strength 0·01 g. per litre). Some difficulty was experienced in finding a liquid which could be used for expelling the air from the bottle without altering the concentration of the mixture by solution of CO_2. Glycerine proved to be most suitable for the purpose, and experiments carried out using this liquid clearly showed that congo-red was sensitive to CO_2 of concentration 0·03 per cent. in the air.

At the present time investigations are proceeding with the use of a powdered silica filter, and it is also intended to examine further the possibilities of the electrical conductivity method.

THE LANCET.

LONDON: SATURDAY, NOVEMBER 20, 1920.

Proportion and Economy.

THE Ministry of Health (Miscellaneous Provisions) Bill was discussed on Monday in Committee of the House of Commons with the result, as all our readers know, that no less than 14 clauses were dropped, while concerning other clauses it was stated that the voice of the Select Committee would be amiably listened to by the Government. Some such event had been anticipated in view of the numerous criticisms which had been levelled against the measure, not only because of the expensive commitments which it included but also because of the heterogeneous character of the matters dealt with. Although this diversity of interests present led to differing analyses both of subjects and of details, the result of the debate was to register the opinion of the speakers that in existing circumstances economy must be maintained, and that the Bill must, therefore, be drastically curtailed in its operations. With purely political strictures upon the measure medical readers have little to do—as influential citizens they will have their opinions; but when the pure, or impure, politician accounts for the way in which the measure has been treated as due to Tory recalcitrancy, to the growing power of Mr. ASQUITH, to the innate profligacy of the Government, or, using the slang of the streets, to "any old thing you like" of a party nature, medical men will prefer to believe that Parliament would place the future of the British race above such things. It is idle to pretend that no party influences have been, or may be, at work; but we would credit the House of Commons, that much-abused institution, with a higher conception of its duties than gossip within and without that assembly appears willing to give it. We are certain that the general feeling of the House was dictated by motives of economy.

The question, of course, is whether the economy is being well directed, and whether a reasonable sense of proportion has been preserved between the need for saving and the need for action. Medical men always feel nervous when economy is mooted in opposition to any measures of a medical bearing, because it is so easy to save money at the expense of lives, to relieve rates at the expense of health, and to preserve pockets while dissipating strength; and it is such considerations, and not the fact that money spent upon health administration passes in some fraction into medical hands, that give economy its terrors for us. While we can acquiesce in the reasons which dictated that a measure with such large and various outlets for expenditure must receive all the scrutiny that our legislators can give before it reaches the Statute Book, yet we would beg all to remember a few main points in relation to health legislation. The mission of the Ministry of Health is primarily to prevent disease. The population of this country is attacked on all sides by preventable disease, while the voluntary worker, the philanthropist, the taxpayer and the ratepayer are drained dry in dealing with the results of disease not as yet prevented. Allow that large sums of money are required to stem the current of evil, it follows as a reasonable supposition that, as that current is stayed, new areas will escape flooding and the areas now flooded will have time to dry off. When that happy consummation is reached less and less money should be required to preserve the general health of the population. That is to say, that money spent now may avert the spending of much more money in the immediate future. We all want economy, but proportion between economy, need, and urgent want should be preserved.

The circumstances of the introduction of the Bill have been particularly criticised, especially the date in the year at which the measure was brought forward; and it is impossible not to see that it would have been more convenient if the Bill had been produced next session. But it is an unfortunate fact that in dealing with masses of existing evil it is universally convenient to put off the day of concrete action. There must always be things which would stand further examination before reform is introduced; to meet the difficulties there must always be differences of opinions as to what is the real cause or the underlying cause of any social circumstances; and until these differences of opinion are adjusted no remedy that one thinker can propose is likely to meet the views of all the others. We are terribly familiar with this sort of procrastination. Before these differences of opinion are adjusted, as happened in the JARNDYCE case, new elements arrive which have their bearing on the dispute; and old elements, once pivots of debate, are crowded out. At no date will it ever appear exactly right to introduce big remedial measures; it will invariably seem that the selected date is either too soon or not soon enough. The grand mission of the Ministry of Health is to *prevent* disease, and as disease is fostered, in one form or another, by every default from a good social standard, the first measures advocated by the Ministry will tend to be of an omnibus character; scrutiny of them will be welcomed by all. In medical eyes it is of paramount importance that the new health legislation, which is urgently required, should fully recognise professional responsibilities. Of the Ministry of Health (Miscellaneous Provisions) Bill, Clause 10, regulating the treatment of incipient mental disease, and Clause 11, in its amended form, remain. They are highly important and we dealt last week with them in full.

Nomenclatures and Classifications of Diseases.

IN the latter half of the seventeenth century the classification of diseases, stimulated by the success achieved by LINNÆUS in botanical science, was much to the fore, and many nosologies now forgotten were constructed by eminent medical men, such as CULLEN, THOMAS YOUNG, and MASON GOOD, to mention a few only in this country. But with the passage of time and the advance of knowledge the fascination of these academic exercises palled, and the difficulties of accurate classification became so clear that little attention has since been paid to the subject except by the writers of text-books and medical statisticians. Of the latter, WILLIAM FARR, the acknowledged founder of medical statistics, who worked at the Registrar-General's office from 1839 to 1879, exerted the greatest influence on medical classification. In this country the Nomenclature of Diseases of the Royal College of Physicians of London first appeared in 1869, and, passing through subsequent revised editions in 1884, 1896, 1906, and 1918, formed the basis of the returns from the Services and the Registrar-General's Office. In the United States of America nomenclatures have been published by the Services and by individual hospitals, such as the Bellevue of New York, the Massachusetts General in Boston, and the Stanford University Medical Department; and this year the Bureau of the Census has brought out a "Standard Nomenclature of Diseases and Pathological Conditions, Injuries, and Poisonings for the United States,"[1] to which further reference will be made.

The subject of death certification is, of course, intimately connected with the larger one of classification of disease. Attempts to obtain international uniformity for the statistics of death began in 1853, and in this movement Dr. W. FARR naturally played a leading part. A list for international use was drawn up in 1855 and revised in 1864, 1874, 1880, and 1886; but in spite of this no two countries employed exactly the same forms and methods for the statistical classification of the causes of death until after 1893. About this date, as the result of the vigorous initiative of Dr. JACQUES BERTILLON, the eminent demographer, the international list was again brought out, and has since been revised by an international commission in 1900, 1909, and 1920. The 1909 revision consisted of 189 headings, the first 60 referring to general diseases and the remainder to local affections. In 1907 Dr. BERTILLON estimated that the list was in use for more than 212 millions of population, and in 1911 the list was adapted for use in England and Wales. Although the objects of the classifications of diseases and of the causes of death do not exactly correspond, the principles underlying the arrangement of these classifications must be identical, and it will therefore be well to make a brief reference to this subject. The earliest classification of diseases in 1680 by FELIX PLATER was based on symptoms, and this plan was followed by SAUVAGES (1768), LINNÆUS, CULLEN, and MASON GOOD (1817). After due trial W. FARR found it impossible to arrange the death returns on this plan, and originated the principle of the locality of the disease; in fact, to quote Dr. BERTILLON, "almost all nomenclatures now (1900) in use are derived more or less directly from that of W. FARR—that is to say, that they classify diseases, as far as possible, according to their anatomical seat and not according to their nature." In 1907, however, LANCEREAUX and PAULESCO reported for a Committee of the Académie de Médecine of Paris in favour of an ætiological basis. At the present time most nomenclatures compromise and classify some diseases as general and according to the ætiological plan and others locally—i.e., with reference to the organs affected. This compromise has, of course, disadvantages, for it is impossible to be rigidly consistent. A scientific classification is highly desirable, but at present it does not appear possible to formulate satisfactory principles for a permanent classification of this kind.

In view of these difficulties, and pending the discovery of sound principles for a scientific classification, the simple plan of alphabetical arrangement tentatively adopted by the Census Bureau in the Standard Nomenclature of (1) Diseases and Pathological Conditions, (2) Injuries, and (3) Poisonings for the United States, has much in its favour. Each of these three sections contains a large number of entries; of these, the "preferred" terms are printed in leaded type and are preceded by numbers, while the synonyms are in lighter type, unnumbered, and provided with a cross reference to the preferred term, under which they should be registered. The first preferred term under the first letter of the alphabet is *Abortion* and is numbered 1001; the first preferred term under B has the number 2001, and so on through the alphabet. The injuries and poisonings are arranged separately, but on the same lines. This work is made up of names taken from eight published nomenclatures, from standard works, and from medical dictionaries. The compilers, under the chairmanship of Dr. W. H. DAVIS, chief statistician for vital statistics, fully recognise that finality is improbable and that a distinct line between symptoms and diseases may be difficult to draw; what is to-day spoken of as a disease may become a syndrome to-morrow. In more than one place it is modestly insisted that this is the first edition, intended to draw from medical men and all others interested in the subject free criticisms, which should make a second edition more perfect. This undertaking was started by the Council of National Defense in 1918, but was entrusted to the Bureau of the Census, and funds were allotted for the preparation of the nomenclature as a war measure. The preliminary work and plans for its completion were discussed by the Advisory Committee on Medical Nomenclature on May 1st and 2nd, 1919, and from "the letter of transmittal," dated June 24th, 1919, the work appears to have been finished within about a year from the time that it was first mooted, though it was not printed and issued until this year.

[1] Department of Commerce: Bureau of the Census, Sam. L. Rogers, Director; Government Printing Office, Washington, D.C. 1920.

The Investigation of Atmospheric Pollution.

STEADY and valuable work is being carried on by the Advisory Committee on Atmospheric Pollution, under the ægis of the Meteorological Office, as the Sixth Annual Report, which we publish as a supplement this week, shows. This Report not only gives the returns of practical observations from 29 stations, but records some interesting results indicating advances in the methods of determining the kind and amount of pollution of the air from smoke, with its corollary of dirty fog. The Committee have decided on schemes of improved attack which are producing results, and they have established a department of research the work of which promises to clear up many atmospheric problems. The injury to health caused by smoke contamination of the air is not realised to the extent it should be, but the work of the Advisory Committee should show the damage to public health in its proper relation to this form of pollution. The present Report shows a marked abatement of smoke pollution. The total solids deposited at practically all stations have diminished during the winter and the summer of 1919–20 as compared with the previous year. The explanation of this is probably the increased use of gaseous fuel, one more argument being thus supplied for superseding coal as an immediate source of domestic heating. A very small percentage of its heating energy is obtained in this way, and the imperfect products of its combustion, representing a great loss of this energy, are poured into the air with results inimical to the well-being of the community and disastrous to fabrics of all kinds. Everybody knows this, but reform tarries.

An interesting feature of the Report is the description of the use of the automatic filter, which was fully described in the Fourth Report of the Committee.[1] Since that time many records have been taken of the suspended impurities in London air and some nice results have been obtained. It has been shown, for example, that there is a cycle in the distribution of the impurities throughout the 24 hours which brings definite reproach home to the open coal fire. At about 6 o'clock A.M., when people light their fires, the impurity commences to increase in quantity, and continues to do so until about 11 A.M. From 11 A.M. till nearly 10 P.M. the quantity varies very little from hour to hour, but at 10 P.M. it rapidly begins to diminish, and has almost disappeared by midnight. There are some interesting results recorded also in the attempts made to determine the acidity of the air, and a tintometer has been designed using methyl-orange and indigo-carmine as indicators in an absorption apparatus. The respective designs are clear from drawings appearing in the Report. It seems open to doubt whether the domestic fire contributes acidity, since the distillation products (smoke) are invariably alkaline from the excess of tar bases and ammonia given off; these are points which investigation should clear up in the course of time. The work of the Committee shows earnestness of purpose all through, and we commend their last Report to the attention of our readers, and indeed to all workers in hygiene and public health.

[1] THE LANCET, June 14th, 191

Annotations.

"Ne quid nimis."

ILLEGAL USE OF THE RED CROSS.

CASES of the unauthorised use by traders and others of the Red Cross emblem and of the words "Red Cross" having recently come to the notice of the War Office, attention is drawn by the Secretary of the War Office to the fact that the use of this emblem or of these words for the purposes of trade or business or for any other purpose whatsoever without the authority of the Army Council is an offence under Section 1 of the Geneva Convention Act, 1911. In this Act, which was passed in consequence of the adhesion of His Majesty's Government to the Geneva Convention in 1906, it is stipulated that the Red Cross emblem or the words "Red Cross" shall not be used, either in time of peace or in time of war, except to protect or to indicate the medical units and establishments and the personnel and material protected by the Convention—i.e., the Army Medical Services of the signatory Powers. It is further stipulated that the signatory Governments shall at all times prevent their employment by private individuals or societies (except those entitled to use it under the Convention), especially their employment for commercial purposes as a trade-mark or trading mark. The unauthorised use of the emblem or words renders the user liable to prosecution for infringing the Geneva Convention Act; it is obviously a duty of all members of the public to assist the Government in carrying out their international obligations in this matter, by strict observance of both the letter and the spirit of the Act and the Convention. It is, moreover, a pity that such a warning should be rendered necessary—presumably by people to whom international or any other obligations are of small moment when they run counter to what is politely termed "business enterprise."

VIRULENT DIPHTHERIA BACILLI CARRIED BY CATS.

ALTHOUGH the available literature on the transmission of diphtheria from cats to human beings is not convincing owing to the incompleteness of bacteriological examination, many cases have been recorded based on clinical evidence alone. Major James S. Simmons,[1] chief of the Laboratory Service, Walter Reed General Hospital, Takoma, D.C., now reports a case in which he offers bacteriological evidence of this transmission. The patient was an elderly woman who developed a fatal attack of faucial diphtheria after fondling a cat which had been ill one week before the patient's illness began. The cat was said to have had a croupy cough, to have been unable to swallow food, and to have become very thin. The symptoms were at first attributed to a piece of chicken-bone having lodged in its throat. Faucial cultures from the cat and from the patient showed morphologically similar organisms resembling diphtheria bacilli, and the virulence for guinea-pigs was the same, the organisms in both cases killing guinea-pigs six days after subcutaneous injection, but failing to produce lesions in animals previously injected intraperitoneally with diphtheria antitoxin. The cat was chloroformed and a careful post-mortem examination made. The only lesion detected was a small oval ulcer covered with a yellow-grey membrane on the upper surface of the left nasal fossa, cultures from which showed diphtheria bacilli. Throat cultures from a second cat, which had often played with the first, also showed morphologically typical diphtheria bacilli. The second cat died after eight days' confinement in a cage, and post mortem showed small membranous patches, from which virulent diphtheria bacilli were isolated, on the vocal cords. The history of contact, dates of infection, and bacteriological findings suggest that the first cat was the source of infection of the patient as

[1] American Journal of Medical Sciences, October, 1920.

well as of the second cat, though, as Major Simmons admits, this cannot be proved. It is certain, however, that both cats were carriers of virulent diphtheria bacilli, and were therefore a danger to human beings.

RETICULATED RED BLOOD CORPUSCLES.

IN conditions of profound anæmia it is often a matter of importance to the clinician to ascertain whether or no the bone marrow is actively engaged in the production of red blood corpuscles. Any method which promises to give reliable information of the existence of such hæmatopoietic activity will be welcome. It is interesting in this connexion to note that Dr. Donald Cunningham in the October number of *Archives of Internal Medicine* contributes a short paper on a Method for the Permanent Staining of Reticulated Red Cells. In specimens fixed and stained by the ordinary methods the chief evidence of immaturity is the presence of nucleated, polychromatophilic, and stippled red cells. If a vital stain such as brilliant cresyl-blue be employed it is possible to demonstrate in certain of the red cells the presence of a fine or coarse granular network; and in recent years considerable interest has been manifested in these so-called "reticulated cells." Among the first to observe this reticulation was Ehrlich, who considered these forms to be an indication of erythrocytic degeneration. It was not till 1907 that Cesaris-Demel suggested that the reticulation was rather a sign of youth of the cell, a conception which is held to-day. The percentage of these cells in the blood stream forms a reliable indication of hæmatopoietic activity, and the ease and simplicity of the method of staining to which Dr. Cunningham calls attention brings the study of reticulated erythrocytes within the scope of routine blood examination.

A BLIND LIGHTNING CALCULATOR.

SOME eight years ago an account was given in THE LANCET[1] of a remarkable case in which extraordinary ability in arithmetical calculation was associated with general mental inferiority, if not actual insanity. The patient was a youth of the name of Fleury, then aged 18, who was completely blind as a result of ophthalmia neonatorum. Partly by perseverence with the Braille method, partly by devising certain mental "tips" of his own, he had reached a stage of extraordinary facility in performing elaborate calculations. A large number of details as to his methods were given on that occasion and, striking though they were, later information about the same case provides us with still more wonderful data, a description of which by Dr. L. Lotte, of the asylum at Armentières, will be found in *L'Encéphale* for March, 1920. Fleury, for example, can give the square root of any number running into four figures in an average of four seconds, and the cube root of any number running into six figures in six seconds; he gave the cube root of 34,012,224 (324) in 11 seconds, and the cube root of 465,484,375 (775) in 13 seconds. These seem mere trifles, however, compared with the following: He was asked how many grains of corn there would be in any one of 64 boxes, with one in the first, two in the second, four in the third, eight in the fourth, and so on in succession. He gave the answers for the 14th (8192), for the 18th (131,072), and the 24th (8,388,608) instantaneously, and he gave the figures for the 48th box (140,737,488,355,328) in six seconds. Further, on the request to give the total in all the boxes up to and including the 64th he furnished the correct answer (18,446,734,073,709,551,615) in 45 seconds. When it is remembered that Fleury has been blind from birth and can have no visual memories the feat becomes really impressive. In an average of 12 seconds he can divide any number, say of four figures, into its prime factors, thus: $2924 = 2^2 \times 17 \times 43$; $5564 = 2^2 \times 13 \times 107$; and so on. Instances were given in our previous annotation of his faculty of telling the day of the week on which any given date falls, and the original methods devised by himself for this were there explained. It appears now, according to Dr. Lotte, that Fleury can give the day for Easter in any year, in the Gregorian and Julian calendars respectively and simultaneously, by some scheme equally original, of which the details are not, however, supplied. Thus, in 1662 Easter fell on April 21st and March 27th respectively (2 minutes 10 seconds), in 1746, March 30th and April 10th (2 minutes 20 seconds), and for 1946 the dates are April 11th and April 17th (40 seconds). Numerous other illustrations are furnished of this altogether remarkable case, which certainly equals if it does not surpass others that have become classical. It is interesting to learn, on the authority of Dr. Lotte, that, thanks to more general recognition of Fleury's exceptional gifts, the opportunity is to be afforded him of further education and instruction, and it is quite possible he will rise to still greater heights of arithmetical attainment and of mathematical attainment in a wider sense, if he is handled by some professional exponent of these subjects. In any case, the psychological interest and importance of such a wonderful example of development of a practically isolated mental faculty warrants our giving the case greater publicity.

[1] THE LANCET, 1913, i., 334.

ANÆSTHETIC RESEARCH IN AMERICA.

THE National Anæsthesia Research Society is doing useful work in America. One of its recent bulletins deals with the annual meeting of the American Association of Anæsthetists recently held at New Orleans. Dr. A. H. Miller in his presidential address at this meeting urged the need for familiarising students with the science and practice of anæsthesia. Dr. A. M. Caine went on to discuss the relaxation obtained by gas and oxygen anæsthesia, urging that with proper manipulation of the oxygen supply, slight positive pressure, the use of warmed gases, preliminary medication, and concomitant local anæsthesia, the desired degree can be obtained. He admits (and many in this country who object to nerve-blocking will echo this) that some surgeons who are used to the profound narcosis of etherisation may not be satisfied with the relaxation obtainable by gas and oxygen. In these cases he has found, in accordance with Dr. H. E. G. Boyle's views, that chloroform is a safe, efficient, and pleasant adjunct to gas and oxygen. The experimental work of Dr. A. Goodman Levy,[1] however, suggests that light chloroform anæsthesia is not devoid of danger. Still, all will agree that less damage is done to the patient with good relaxation under gas oxygen anesthol (though we would prefer ether in lieu of the mixture of chloroform, ether and ethyl chloride, commonly known as anesthol) and gentle operative manipulation, than with gas and oxygen alone and the rougher surgery necessitated by inadequate relaxation. The problem of anæsthesia in goitre surgery is indeed difficult, and, as Dr. A. Crofti rightly states, too often failures and misfortunes are charged to the anæsthetist, when the fault lies in the judgment of the surgeon and an injudiciously performed operation. Dr. Vilray P. Blair remarks that the proper correlation of the anæsthetic to the technique is of vastly more importance than the particular anæsthetic agent employed. Kocher, Crile, and the Mayos respectively stand for local, anociation, and open-drop ether. Dr. W. E. Lower emphasises the value of anociation, and explains how with nitrous oxide-oxygen the degree of unconsciousness may be graded to suit the condition of the patient at every stage in the operation. The possibilities of very light anæsthesia have been advocated here by Dr. Mary Dickinson Berry,[2] whose results with light open ether are certainly most satisfactory, both as regards increased safety and diminution of disagreeable after-effects. Gwathmey's ether-oil colonic anæsthesia is advocated by Dr. Walter Lathrop, but the objection to this method is the impossibility of exercising control as to the depth. We are astonished not to find intratracheal ether referred to, for Dr. F. E. Shipway has long employed this method, preceded in

[1] Proc. Phys. Soc., Jan. 21st and Oct. 21st, 1911, and Brit. Med. Jour., Sept. 14th, 1912.

[2] Proc. Roy. Soc. Med., June, 1920.

the majority of cases by morphine and atropine, with much success.

The Research Society has adopted a uniform chart for recording phenomena during and after anæsthesia which it is supplying to all hospitals willing to employ it. The chart records, besides nature of anæsthetic and method of administration, nature of operation, &c., pulse, respiration, and blood pressure by readings taken apparently every 15 minutes. There is no doubt that such charts conscientiously filled in under the supervision of experts would represent a large amount of information, probably, it is true, merely confirmatory in character, but possibly also fertile in suggestion as to the causation of various difficulties during anæsthesia. Many of the teaching hospitals in Great Britain, we believe, obtain similar records of all operation cases, made by the students "clerking" for the anæsthetists. No doubt the information thus obtained is reproduced by the latter in their teaching and writing. The adoption of a uniform chart would enable statistics on a large scale to be easily collected. These would be valuable in helping the elucidation of some particular clinical point which it was desired to study. They would suffer, of course, as do all such statistics, from the variable nature of the personal element. The value of statistics to an investigator depends chiefly on his knowledge of the value to be placed upon those who have collected them.

OPERATIONS ON THE STOMACH.

THE three instructive gastric cases shown by Mr. R. P. Rowlands at a recent section of the Royal Society of Medicine, and recorded in our present issue, were designed to raise points of principle in gastric surgery which are gradually becoming clear. Since gastro-jejunostomy was first performed in 1881 by Wölfler the progress of gastric surgery has been remarkable and continuous, and operations upon the stomach have become increasingly safe, extensive, and radical. The careful preparation of the patient before operation, the use of clamps, and the general improvement of technique have almost abolished the risk of primary septic infection. The adoption of the hæmostatic suture has done away with the risk of hæmorrhage and leakage, and the general use of well-prepared catgut will probably greatly reduce the danger of gastro-jejunal ulcer—the complication most to be feared after gastro-jejunostomy at the present time. The very small mortality of gastric operations carried out by experts may, however, become misleading, in that it induces a large number of surgeons with insufficient experience to perform this operation without due thought of the functional after-results. Gastro-jejunostomy for duodenal ulcer is generally admitted to give, in good hands, excellent results, in fact, 95 per cent. of cures, at very small risks and under 1 per cent. mortality. For gastric ulcer, under similar conditions, it gives a 75 per cent. chance of cure. It should, however, never be performed except for the relief of a gross visible and palpable lesion in the duodenum or stomach, for most of the bad results of the operation have followed its use in unsuitable cases. Lately it has been urged that partial gastrectomy is the best treatment for gastric ulcer. This is rather dangerous teaching for, even in the best hands, its mortality is at least five times that of gastro-jejunostomy. If every surgeon in the land adopted it the mortality would be even higher, for the operation calls for much skill, experience, and judgment. Its adoption for gastric ulcers adherent to or invading the liver or pancreas—the very cases which do least well after gastro-jejunostomy—is not to be generally recommended, for it may then be a very difficult and dangerous operation. For the treatment of cancer of the stomach this risk is justifiable. When cancer is present or feared, or has supervened on simple ulcer, the risks of partial gastrectomy are well worth running. The only hope of progress in the treatment of cancer of the stomach is in earlier operation. When it is suspected, not more than a fortnight should be spared for preliminary examinations—X ray, gastric analyses, &c.—valuable as they are. As the disease remains localised in the stomach for a long time an early operation is most hopeful. This fact should be more widely known, for many patients are not sent in time because it is too generally believed that cancer of the stomach is incurable. The results of surgical treatment of hour-glass stomach are also gratifying. The risk of death and all complications, in good hands, are practically negligible. This is remarkable considering how thin many of these patients are, but they are used to short commons, having usually suffered for years from partial starvation. As a rule gastro-gastrostomy is the best and safest operation for the relief of hour-glass contraction, but when pyloric stenosis coexists gastro-duodenostomy or gastro-jejunostomy has to be added. When, however, carcinoma has supervened on the ulcer causing this contraction partial gastrectomy has to be performed if possible.

A SUGGESTED NATIONAL INSURANCE PHARMACOPŒIA.

AT the recent Conference of Representatives of Local Medical and Panel Committees the proposal was made that a National Insurance Pharmacopœia should be compiled to replace the local formulæ at present in use. The motion was lost by a small majority, but the subject is one of considerable practical importance, and, if we may judge from the published reports, it did not arouse the interest which it deserves. The present system favours individuality, a character not to be lightly discouraged in the methods of the practitioner, nor, as in the present case, in those of a group of practitioners; but we think, as far as the matter under discussion is concerned, that the weight of evidence, when both local and national needs are considered, points to the desirability of greater centralisation. Although the majority of the local formularies are doubtless excellent compilations, it must be assumed that the standard would be raised to an even higher level if the work were placed in the hands of a central representative committee of experts in therapeutics and pharmacy; the expenses of production would, at the same time, be materially lessened. Perhaps the chief disadvantage of the present system, however, is that a practitioner who attends patients in several adjoining areas may have to draw upon as many as three or four different lists for his prescriptions. Further, under the proposed scheme greater uniformity in the composition of the remedies prescribed would allow of their preparation in increased quantities and at diminished cost; this argument applies particularly to such medicaments as pills which, in this mechanical age, can be prepared more satisfactorily by manufacturing druggists than by the individual pharmacist when large quantities are needed. Should the proposal to institute a National Insurance Pharmacopœia be ultimately carried out, some modification in the system of payment for medicines supplied might be found necessary, but there should be little difficulty in arriving at an arrangement which would effect a saving by the process of standardisation, and yet secure to the pharmacist an adequate remuneration both for articles in respect of which he acts as distributor and for the skill which he is called upon to exercise in connexion with compounding. We hope that the matter will be reconsidered at a future conference of insurance practitioners.

RACIAL TUBERCULOUS SUSCEPTIBILITY.

UNDER the heading "Tuberculosis in Primitive Tribes and Its Bearing on the Tuberculosis of Civilised Communities" Professor S. Lyle Cummins publishes in the *International Journal of Public Health* for September a fair number of facts in addition to the speculations and hypotheses which have already been discussed in our columns.[1] In passing, we welcome Professor Cummins's appointment to the Chair of Tuberculosis in the University of Wales, which will also make him administrative head of the immense clinical resources of the Welsh National Memorial. It is not altogether the author's fault that his fare in the Geneva journal

[1] THE LANCET, Oct. 30th, pp. 891 and 1024.

is somewhat Barmecidal, for the evidence on which to build any hypothesis regarding the many problems of tuberculosis is almost overwhelming in quantity and perfectly distracting in lack of accuracy. A few years ago it was said of a prominent politician that it could be conclusively proved by his speeches that he was in favour of Free Trade, Protection, both and neither. The supporters of various hypotheses professing to explain the erratic ways of tuberculosis are in much the same position: there is plenty of evidence, of a kind, wherewith to make out a plausible case for almost any hypothesis. Professor Cummins's facts are more helpful, and with regard to the ravages of tuberculosis among our native levies he discloses information which it was inadvisable to publish during the war. It appears that in 1917–18 the average strength of the British troops in France was over a million and a half, but there were only 2881 cases of tuberculosis, with 165 deaths. In the same period the average strength of Cape Boys and Kaffirs was only about 11,000, but the deaths from tuberculosis numbered 182. The Fijian Labour Unit had to be repatriated on account of tuberculosis, and in 1916 the incidence of tuberculosis among the Indian divisions in France was 27·4 per 1000 as compared with 1·1 per 1000 British troops. Professor Cummins also refers to a recent paper by A. Borrel on tuberculosis in the French African troops. Among recently recruited Senegalese at the Camp of Fréjus, Borrel found v. Pirquet's reaction positive only in 4 or 5 per cent. In 1916 there were only 48 deaths from tuberculosis in this camp. In 1917 the deaths rose to 312 and in 1918 to 557—an increase from 6·24 to 11·14 per cent. This susceptibility to tuberculosis cannot, however, be regarded solely as a racial phenomenon, for, as Dr. Klotz, of the American Army Medical Service has shown, there was no excessive susceptibility to, or mortality from, tuberculosis among the negro battalions in the American Expeditionary Force.

DIPHTHERITIC PARALYSIS OF THE RESPIRATORY MUSCLES TREATED BY PROLONGED ARTIFICIAL RESPIRATION.

Dr. W. M. Marriott has recently reported[1] a remarkable case of diphtheritic paralysis of the respiratory muscles, in which life apparently was saved by prolonged artificial respiration.

A girl, aged 10 years, was admitted into the St. Louis Children's Hospital six weeks after a severe attack of pharyngeal diphtheria. She had received intramuscularly 10,000 units of antitoxin. About a week after the attack signs of palatal paralysis appeared. Subsequently the muscles of the eyes, extremities, back, and neck became paralysed. On admission she could not move the legs or body or hold up the head. Swallowing was very difficult. There was almost complete aphonia and much difficulty in expectorating mucus. The heart was enlarged, the left border being 3 cm. outside the nipple line. Electrocardiographic tracings showed evidence of myocardial affection. There was dyspnœa with slight cyanosis. During inspiration the abdomen was retracted. The temperature was normal, and a culture taken from the throat was negative for the diphtheria bacillus. The urine contained a small amount of albumin and a few hyaline casts. The dyspnœa increased. No movement of the diaphragm could be detected, and ultimately the intercostal and accessory muscles of respiration became involved. The cyanosis deepened and the child became semi-comatose. There were no signs of pneumonia or obstruction to the respiratory passages. It was evident that death from suffocation would ensue unless artificial respiration was employed. An apparatus designed by Gesell and Erlanger to convert a continuous air-current into an intermittent one of any desired rate and volume, and used extensively in physiological laboratories for artificial respiration in animals, was employed. A nitrous oxide mask was connected to the apparatus and applied to the child's face. There was at first no coöperation, partly on account of the semi coma. But within a few minutes the slight response necessary was obtained and air was forced into the lungs. The cyanosis disappeared and the patient became sufficiently conscious to coöperate well. The rate of respiration of the machine was adjusted to correspond with voluntary respiration. After ten minutes the child fell asleep and the mask was removed. Cyanosis slowly developed again and was again relieved by artificial respiration. This was kept up during most of the time the child was awake. It was possible to discontinue artificial respiration for short periods when she fell asleep. Artificial respiration was kept up at intervals for five days. Then the respiratory muscles had so far regained their function that it was necessary only at relatively infrequent intervals. When the child was perfectly quiet it was not necessary at all. But after exertion, such as coughing or after feeding with the nasal tube, it was necessary to apply the apparatus for a short period. The power of the respiratory muscles steadily improved and after a week artificial respiration could be altogether dispensed with.

As the majority of cases of diphtheritic paralysis of the respiratory muscles are fatal, some form of artificial respiration would seem advisable in every severe case. Other means than the one here described might be adopted. The possible risk of aspiration pneumonia should not influence the practitioner against artificial respiration when the greater danger of suffocation is threatened.

[1] Journal of the Americal Medical Association, Sept. 4th, 1920.

LEPROSY IN NEW SOUTH WALES.

THE Public Health Department's Report on Leprosy in New South Wales gives a good deal of information in tabular form, but with very little comment. The Coast Hospital Lazaret was opened in 1883, although detention of lepers was only made compulsory late in 1890, after which the number of admissions increased greatly, the total to date having been 149. Of these 67 have died, 18 have been discharged or absconded, 40 repatriated, mainly coloured races, especially Chinese, and 24 remained at the end of 1919. During the last four quinquennial periods the admissions appear to have been 28, 20, 16, and 14 respectively, showing a steady diminution, although this has been mainly among the coloured races, so may have been due to closer inspection of immigrants; no information on the effect of the compulsory segregation of lepers on the prevalence of the disease in the colony is given in the report. Notes of each of the remaining cases are to be found among the appendices, from which it appears the majority of the patients have been treated more or less regularly with gynocardate of soda orally, but its more efficient intravenous use is not mentioned. A few were given only chaulmoogra oil. The notes give no information regarding the effects of the treatment except as regards the weight of the patients, but nearly two-thirds of the gynocardate of soda cases appear to have gained weight, as did two out of four cases on chaulmoogra oil. Owing to the policy of repatriation of most of the coloured cases the majority of the remaining inmates are of white descent. The cost of upkeep amounted to £138 5*s*. per head of the patients.

"P.U.O." IN CIVIL PRACTICE.

THE war brought to the notice of medical officers in the field the frequency of pyrexia whose origin was not only "uncertain" at the time of observation, but also difficult to discover after employing all the available means of diagnosis. In India, as Lieutenant-Colonel A. White Robertson last week reminded the Hunterian Society (see p. 1046), short acute fevers used to be hastily labelled malaria; not so long ago they were here dubbed influenza. All the criteria which Colonel Robertson suggests for differentiating chronic fevers may not command general assent, but we cordially endorse his plea to the practitioner to take a many-sided look at "P.U.O.," whether martial or civil.

THE Bradshaw lecture on the Surgery of the Diseases of the Spleen will be delivered at the Royal College of Surgeons of England by Sir Berkeley Moynihan on Monday, Dec. 6th, at 5 P.M.

THE next Congress of the Royal Institute of Public Health, which will be of an international character, will take place in the University of Geneva from May 10th to May 16th, 1921.

PLAGUE IN TURKEY DURING THE WAR.

By F. G. CLEMOW, C.M.G., M.D.,
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FOR many years preceding the war it was my privilege to send from time to time to the columns of THE LANCET as consecutive records as possible of the prevalence of plague, cholera, and occasionally other diseases in Near Eastern countries. During the war Western Europe has been able to learn but little with accuracy as to the occurrence of these diseases in Turkey, and in the present paper an attempt will be made to fill in this large gap in the history of one disease—plague. In later papers I hope to do the same for cholera and typhus fever.

The information herein summarised has been obtained mainly from Turkish records, and particularly from reports received from various parts of the country by the Turkish "Frontier Sanitary Administration"—the self-constituted body which, during the war, took on some of the functions of the former administration under the International Board of Health of Constantinople. The figures about to be quoted are said to include both civilian and military records. Of their accuracy it may, I think, be said that they in no case exceed the truth; that in many instances they are probably considerably below the truth; while important gaps exist in the records, both geographically and in time, and at present it is impossible to bridge those gaps.

The most serious outbreak of plague was that which occurred in Bagdad and the neighbourhood in the years 1914–15. It probably began in Basra, where 20 cases of plague, with 12 deaths, were recorded between May 25th and July 17th, 1914; and during that time infected rats were found on the premises of a British shipping company on the shores of the Shatt-ul-Arab river. Bagdad itself had been free from plague since 1909. The first case was seen on Sept. 17th, 1914, and the epidemic lasted until July, 1915. In those ten months 2008 cases, with 1622 deaths, were registered, distributed as follows:—

1914.	Cases.	Deaths.
Sept. 17th–30th	3	0
October	14	14
November	11	9
December	32	23
1915.		
January	153	99
February	197	158
March	328	245
1915.	Cases.	Deaths.
April	698	620
May	523	413
June	45	39
July	4	2
August	0	0
Totals	2008	1622

In other towns in the neighbourhood the returns were as follows:—

Kiazimieh.		
1915.	Cases.	Deaths.
March	4	4
April	39	21
May	32	30
June	18	15
A'azamieh.		
March	6	5
April	13	5
May	23	18
June	1	1

Kerbela.		
1915.	Cases.	Deaths.
March	2	2
April	1	0
Bakuba.		
April	1	0
Kizil-Robat.		
April	6	5
May	6	5
Deltaoua.		
April	1	0
Totals	153	111

Kiazimieh is almost a suburb of Bagdad; Kerbela is one of the great holy cities of the Shiahs, containing the tomb of Hussein; Bakuba and Kizil-Robat are on the main route to Persia from Bagdad.

So far as the records show, plague was absent from all parts of Turkey between July, 1915, and June, 1918, when one case occurred in Smyrna. It may be recalled that sporadic cases of the disease were not uncommon in that port before the war, and one such case was seen there in October, 1914. In September, 1918, there was a revival of the disease there, and in that and subsequent months the following figures were recorded: Between Sept. 10th and the end of 1918 54 cases and 13 (?) deaths; January–April, 1919, only 3 cases; May–December, 1919, 41 cases, 17 deaths. The highest figure for one month was 11 cases in October. Finally, in the present year there were 2 cases and 1 death in January, and since July 17th some 13 sporadic cases have occurred in Smyrna, which is still treated as an infected port. The disease has also appeared in towns near Smyrna; in Vourla there were 9 cases between June and December, 1919, and 1 in January, 1920; in Magnesia, 5 cases between July and September; and in Foglieri, 1 in November, 1919, and 1 in January, 1920. Recently 4 cases have been seen in Scala-Nova, between Oct. 4th and 8th.

Some other outbreaks of plague since the Armistice have also to be mentioned. In Constantinople plague reappeared, after a long absence, in September, 1919. The source of infection was unknown; but the first cases occurred in connexion with a granary. Between September and Jan. 19th, 1920, 54 cases, with 19 deaths, were registered. After a plague-free interval the disease broke out again in April, and since April 24th 56 cases have been recorded. Several of the cases occurred among repatriated Turkish prisoners in a large barracks at Haidar Pasha. A noteworthy feature of the outbreak has been the absence of infection among rats. In Beirût plague appeared in June, 1919, and about a dozen cases occurred in June and July; there was a recurrence in the autumn, and between October and January over 70 cases were recorded. It revived again in June last, and about a score of cases have since been reported. In connexion with this outbreak, mention must be made of an imported case in Caiffa on Jan. 27th last, followed by single cases there on Feb. 23rd, March 6th, 20th, and 29th. In the Lebanon also (place not named) 2 cases occurred in January.

Sporadic cases have also been reported this year from the following places: Adalia (2 cases in July and August); Zante (3 cases in July); Canea (6 cases before May 17th, and 2 in June); Chios (6 cases in April); Nauplia (2 cases in August); Cavalla (3 cases in July and August); Mersina (1 case in September); while a certain number of cases have also been seen in Athens, Piræus, and Salonika.

Finally, mention must be made of an outbreak of plague in Trebizond in the years 1917–18. From Russian sources it has been learnt that a Russian Commission was sent there at that period; that they confirmed bacteriologically the nature of the disease; and that they considered that Trebizond had become an endemic centre of plague. No figures have, however, been published. From Trebizond plague appears to have been introduced to Batoum by refugees from the former town; and since the beginning of July last 75 cases have been registered in Batoum. It is said that the infection has not spread to any other Caucasian town.

Constantinople, Nov. 4th.

CONTROL OF VENEREAL DISEASE.

Worldwide Antivenereal Legislation.

THOSE who recognise the value of the sociological study of venereal diseases without themselves having the time or opportunity to range far afield will do well to study the stimulating and enlightening article in the September number of the *International Journal of Public Health* by Mr. Walter Clarke, assistant editor of that journal, and acting chief of the Department of Social Hygiene of the League of Red Cross Societies. In it he gives in admirable proportion a comprehensive outline of the legal and other measures taken within the last few years with a view to reducing the ravages of venereal diseases. Mr. Clarke emphasises the fact that the countries which have gone furthest in applying legal and administrative measures of health protection to the control of syphilis and gonorrhœa are the newer Anglo-Saxon communities, and notably Canada, the Union of South Africa, Australia, New Zealand, and the United States. Public health workers in the older countries have been handicapped as regards rapidity of thought and of action by the accumulated ignorance and mock-modesty environing sex questions.

Mr. Clarke gives a crisp account of the principal legal and other enactments carried through in the foregoing countries. In 1915 the States of Western Australia

passed an Act bringing venereal diseases under the control of the public health authorities, which laid the foundation for legislation in many other countries. Of this Act the writer gives us a clear epitome. Its principal clauses dealt with: (1) the infliction of heavy penalties for the conscious transmission of disease, (2) notification, (3) compulsory treatment; and they have been taken over in the new Public Health Act of the Union of South Africa, which Mr. Clarke describes as the most complete of its kind. It is, he says, worth the careful study of all persons interested in public health work, incorporating as it does the modern conception of administrative sanitary science.

Turning to the United States of America, we note that the control of venereal diseases is a prerogative of each State. Before 1917 progress had gone as far as legislation in 48 States for dealing with prostitution and venereal diseases; this was partly due to the work of some 30 city and State "vice commissions." As a result of their examination of the conditions of prostitution, and the part it played in the spread of venereal diseases, there was complete unanimity in advocating the abolition of segregation and regulation, including medical inspection. These measures have now been abandoned by all important cities in the United States. Certain conclusions arise out of a careful perusal of Mr. Clarke's paper:—

(1) That although the bulk of legislation in the countries referred to is too recent to allow of passing a final judgment as to success, yet on the whole the working of compulsory notification is regarded as satisfactory. (2) The problem of prostitution has received elsewhere much more serious attention as a factor contributory to venereal disease than it has in Great Britain; but although there is need for the investigation of professional prostitution in this country, difficulty is presented by the increasing prevalence of promiscuous intercourse in all classes of society. This phase of the problem may tax the diagnostic acumen of the most searching investigators. (3) The American Federation of Labour, assembled in convention, endorsed the efforts of the United States Public Health Service, coöperating with the various States, in combating the spread of venereal diseases; and called upon organised labour to assist in every possible manner the eradication of these scourges of civilisation.

We may hope that the Labour Party in this country will not do less towards the solution of a problem which involves the life and happiness of all classes in the community. The second part of Mr. Clarke's paper, dealing with new legislation in Europe, will be awaited with interest.

Juvenile Residential Treatment.

The number of children who are infected with venereal disease is certainly not appreciated outside medical circles, and not even, we venture to think, by a large number of medical practitioners. By workers at venereal clinics the pathetic fact is clearly recognised that at the present time there is a large, and, we fear, an increasing number of young children of both sexes suffering from syphilis or gonorrhœa. The difficulties of adequately treating these cases are great. It is not easy to make arrangements for the children to be brought with regularity to hospitals or clinics, while their domestic arrangements are such as to prolong the duration of the disease and to facilitate the transmission of infection to others in the same house. Apart from the lock hospitals and lock wards in infirmaries, there is no institution specially devoted to the reception and treatment of juveniles suffering from venereal disease. At the Lock Hospital the accommodation is limited. At the infirmaries the child is apt to be brought into undesirable contact with adults who are suffering from the same class of disease. The number of children in the Metropolitan area alone who are in need of treatment is great.

It is therefore with gratification that we announce the formation of a home destined especially for the reception of such cases. Under the auspices of the Federation of Children's Rescue Committees "The New Medical Home for Children Suffering from Venereal Disease" has been opened at Coldharbour House, Waddon, Surrey. At this home children will be taken as in-patients. They will receive regular medical treatment, and in cases where it is desirable facilities for their education will be provided. At first there will only be accommodation for 12 girls between the ages of 3 and 14, but later on it is hoped that little boys between the ages of 3 and 9 will also be admitted, and that eventually the home will accommodate 25 children. Our hope is that this brave piece of pioneer work (for the financial anxieties are acute) will result in so excellent an example being followed elsewhere. Municipal authorities and voluntary agencies should see their way to giving financial help. By contributing to the cure of infected children who may be drawn from outside their borders the ratepayers' money may be saved, for infection may easily spread from the untreated infected children in one district to the hitherto uninfected in another. Further information will be given by the honorary secretary, Miss M. R. Darton, 96, Thurlow Park-road, London, S.E. 21, or the honorary treasurer, Mr. R. Davies Colley, F.R.C.S., 10, Devonshire-place, London, W.1.

An Inquiry into Certain Medico-social Questions.

A Special Committee of the National Birth-rate Commission has been appointed to inquire into certain aspects of venereal disease which are attracting public attention at the present time. The terms of reference to the Committee are to consider the following questions:—

(1) Whether sexual continence before marriage is consistent with normal health.

(2) Whether self-disinfection as a method of preventing the development of venereal disease in persons who have exposed themselves to the risk of infection is more efficient or less efficient than medical treatment at venereal clinics and early treatment centres.

(3) The possible advantages and disadvantages of various suggested methods of self-disinfection; (*a*) before, (*b*) after sexual intercourse.

(4) Whether methods of self-disinfection involve any serious disadvantages of a moral kind—that is to say, whether they are calculated to weaken moral control, and thereby to lead to an increase in promiscuous sexual intercourse; and, if so, to what extent these disadvantages should render the use and advocacy of self-disinfection undesirable when considered from the point of view of ultimate national welfare.

Among its members are:—

Sir Arbuthnot Lane, Sir Alfred Pearce Gould, Sir F. W. Mott, Sir Humphry Rolleston, Sir Sims Woodhead, Professor R. A. Bolam, Mr. Charles J. Bond, F.R.C.S., Mr. Charles Gibbs, F.R.C.S., Dr. T. Eustace Hill, Dr. Eric Pritchard, Dr. Amand Routh, Dr. Agnes Dunnett, Dr. Mary Scharlieb, and Professor William Wright.

The Ministry of Health has undertaken to assist the inquiry by all the evidence and information at its disposal.

All communications for the Committee should be sent to the secretary, Rev. James Marchant, Rhondda House, 60, Gower-street, London, W.C. 1.

International Agreement Regarding Treatment of Merchant Seamen.

The question of venereal disease amongst merchant seamen closely affects the population of maritime and river ports in all countries. The value of treatment obviously depends on its systematic continuance for months, and the merchant seaman, by the conditions of his employment, is frequently prevented from obtaining it. His long absences at sea render him peculiarly liable to contract these diseases on his occasional visits ashore and to become a means of spreading them at other ports and on his return home. The Office International d'Hygiène Publique at its recent session considered the matter to be of such importance as to necessitate the regular establishment by international agreement of the means for continuous treatment at seaports. The Office International has prepared a draft arrangement for submission to the different Governments and to the League of Nations. As its members are experts officially appointed by the Governments of the countries they represent, any recommendations they put forward by the Office must carry weight. The proposed international agreement would provide for the establishment of special centres in the chief sea and river ports of all countries at which merchant seamen, irrespective of nationality, could obtain free and skilled treatment for venereal diseases. By means of special confidential forms containing medical notes of diagnosis and treatment to be supplied to the seamen the

doctor at the next port of call would be enabled to continue the treatment with an accurate knowledge of the history of his patient and of the steps that had previously been taken to deal with the case. The seaman would also be provided without cost with such drugs or dressings as might be necessary for him during the voyage from port to port; and in order to bring the existence of these free treatment centres to the knowledge of the seamen, and to induce them to take advantage of them, a duty would be laid on shipmasters and port health authorities to inform the crews of all vessels entering a port of the situation of these centres and the hours of consultation.

HOUSING NOTES.

Problems of Suburban Life.

IN his annual health report Dr. W. J. Howarth, M.O.H. for the City of London, refers to the enormous waste of time which results from employees not being able to live near their work; railway travelling he considers a source of nervous irritation, not only as a consequence of the discomfort and rush, but from the available hours for recreation being reduced by the time taken in going backwards and forwards to work. Although the railway carriage sometimes serves as a business man's club, and in consequence an admirable tonic for the nervous system, there is doubtless much truth in Dr. Howarth's contentions. He has probably understated rather than overstated the unhealthy aspect of railway travelling; the waiting about on cold and draughty railway platforms during inclement weather must be responsible for a certain amount of catarrhal and other diseases of the respiratory system. Many habitual railway travellers will agree that after a railway journey to the office when they commence work they feel as if they were in the middle of the morning's work rather than at the beginning. Dr. Howarth goes on to advocate that local authorities should be given reasonably wide powers to town-plan, built-on, or partially built-on areas, and calls attention to the long-recognised fact that there is a maximum size of town, comprising a population of 200,000 or less, which is consistent with the greatest efficiency of local administration and general well-being of inhabitants. Local advantages, whether of geographical situation, natural resources, or otherwise, may prove too strong to limit excessive extension in certain industrial areas, but, even in these instances, it will be found that some trades need not have been established there, and to prevent further encroachment on available area unnecessary trades might still be refused the right of entering there. Greatly increased power of controlling the use to which land is put is an essential requirement if housing difficulties are to be avoided in the future.

Ex-Service Men as Builders.

The official journal of the Housing Department of the Ministry of Health recognises shortage of labour, and especially skilled labour, as one of the main factors delaying the progress of housing schemes. Some means must be discovered of augmenting the supply of skilled labour, and in view of the number of unemployed ex-Service men their employment in this work would seem to be an obvious solution of the difficulty. The building trade is unfortunately divided in the matter of allowing ex-Service men to work at building; the bricklayers and carpenters, we understand, are hostile, while certain unions, notably those including plasterers, masons, and slaters, have passed resolutions in favour of admitting them. There is no danger of sweated labour, the new men are to be classed as adult apprentices and the union men would have to instruct the newcomers. There is no prospect of slackness in the building trade for years to come, and guarantees against unemployment are generally held to be unnecessary. Although one swallow does not make a summer, the fact that a bungalow has been built entirely by a wounded ex-soldier at Streatham is an indication of what these men can do. The accommodation comprises a parlour and two bedrooms, all 14 ft. by 14 ft., a spare room, and a good-sized kitchen, with outhouse and coal-house at rear; the entrance-hall is large and can be used as a small sitting-room if necessary; the total cost of the bungalow has been £850. This might be regarded as somewhat high, unless the disability of the ex-soldier, who erected it single-handed, is taken into account. Naturally, subsidised building schemes should provide employment for more than the proportion of disabled soldiers necessary for the use of the honourable badge permitted to firms fulfilling the national obligation to employ this class of man. There is, perhaps, a tendency to be somewhat chary of expressing emotion, even that of gratitude; but we feel certain that the national sentiment is strongly in favour of employing men who have "done their bit" in the armed forces to combat the serious existing position of housing.

Housing Degeneration in Bristol.

At a recent meeting of the Bristol Health Committee an interesting discussion arose out of the report of the inspector of nuisances. Councillor Pope stated that there was a large amount of property in Bristol getting into a state of disrepair because the landlords, in spite of representations of their tenants, were refusing to carry out any repairs. The inspector, in response to a question, stated that only in a few of these houses were the tenants in arrear with their rent. The view taken by the committee was that some action was necessary to prevent these houses degenerating into slum houses, and although an alderman reminded the meeting that there was a law which compelled landlords to do what was necessary and that the committee should be careful how they acted, it was decided in the cases referred to that the usual statutory notices should be sent requiring the owners to remedy the sanitary defects complained of. This state of affairs is only too common throughout the country, and drastic action is required on the part of sanitary authorities to endow landlords with a sense of their responsibilities.

Garden Villages.

An open-air village will soon be found at Onslow, near Guildford, on the northern slope of the Hog's Back, where the density of houses is to average five per acre. Of the 646 acres that comprise the estate 200 will be covered by the garden village and the remainder will be used for small holdings, farms, factories, and works. The bricks and tiles are being made on the estate; fortunately, a deposit of sand 120 feet long has been found at a depth of a couple of feet. Nine cottages of the parlour type had been completed by Nov. 1st and 24 others are in various stages of construction. It is anticipated that the first 50 cottages will be ready by February. Although rapid progress has been made with this garden village, Ealing seem to have done even better; the scheme there comprises 239 dwellings, of which 44 will be flats; two contractors are at work on the first half of the scheme, which consists of 103 houses. By September last 50 were let and 46 were actually in occupation.

Dr. Addison stated recently in the House of Commons that the number of houses completed by local authorities on Oct. 1st, not including 1238 army huts converted into dwelling-houses, was 10,042.

The Ministry of Health have not seen fit to sanction the borrowing of £37,000 by the Ealing Town Council to buy 74 acres of land at Pope's Lane, South Ealing, for public walks and pleasure-grounds. A majority of the town council voted in favour of the purchase in view of the congested state of the southern part of the borough, which was quite unprovided with any recreation-ground. It may be that the price of the ground influenced the Ministry's inspector. Contiguous ground was being sold without restriction at practically £500 an acre, and although part of the new ground was not suitable for building, yet the price was to be practically the same, notwithstanding the restriction that it was never to be built upon. When times become more normal it is hoped that Acton, Chiswick, Brentford, and Ealing, with the help of the Middlesex County Council, will combine to provide a large park to serve as an open space for the people of Greater London.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Restrictions on Travel in Ireland.

THE Government has declared its intention to adopt restrictive measures as regards railways and motors which are fraught with serious consequences to social and economic life in Ireland and to the conditions of medical work. For months past the railway workers on several of the railways in Ireland, following on the lines adopted by their fellows in England as regards munitions for Poland, have declined to handle munitions of war or work trains containing armed men. In each case the offending worker was dismissed or suspended by the railway company. Military and constabulary officers in Ireland appeared for some time to acquiesce in this refusal of railway workers, and motor lorries were used alike for the transport of munitions and armed men. Of late, however, the Government has adopted a more active line, and each day at certain stations on two of the main lines armed soldiers or police entered particular trains. In every case the same thing happened. The guard refused to start the train, the armed men withdrew, the train ran to its destination, and the guard on his arrival was dismissed. Naturally, with this happening day after day the supply of guards is now nearly exhausted. An Order in Council was issued last week empowering "the competent naval and military authority" not only to restrict and prohibit traffic, but to take possession of any railway undertaking. The Chief Secretary, in one of those semi-official, semi-political pronouncements which have recently become frequent, announces that the railways cannot carry on, and that economic disaster to part of Ireland will result. He announces, further, that on the stoppage of the trains will follow the stoppage of the mails and the stoppage of the payment of old-age and other pensions that now depend on mail deliveries.

In expectation of such a crisis steps had been taken by wholesale dealers and by committees of consumers in large cities to prepare a system of motor transport for goods. Simultaneously, however, with the Chief Secretary's decision as regards railways, the Government has suddenly imposed new and drastic restrictions on motor traffic. Up to the present it has not been necessary for heavy motors and tradesmen's vans to obtain permits. In future all such motors will have permits, and the permit only holds good within a radius of 20 miles from the residence of the owner. Any system of through transport is thus rendered impossible. The conditions of stagnation to be produced may interfere gravely with the work of medical men. Apart from the fact that, in common with other well-conducted citizens, they will suffer inconveniences from the lack of supplies and deprival of their mails, their work of attendance on old people and on disabled soldiers will be enormously increased by the starvation to which the latter are likely to be reduced. Moreover, without their supplies of drugs and instruments it is hard to see how they can carry on their work. As regards light motor traffic, no further restrictions are imposed on medical men, but other users of light motors are not permitted to use the roads after 8 P.M. This will mean in many cases that sick calls cannot be sent in country districts and loss of life is bound to occur. Without troubling at all on the political side of the position, one must point out that the Chief Secretary's threat to deprive disabled soldiers of their pensions is entirely unjustifiable. The responsibility to put his pension in the hands of the pensioners rests with the Government, and to punish him for the acts of his political opponents is a strange reward for his services in the field.

Nov. 15th.

IT is announced that Bethnal Green Poor-law Infirmary is in future to be called the Bethnal Green Hospital.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Treatment of Nervous Complications of Syphilis.

Dr. J. A. Sicard deals with many problems concerning syphilis in a long communication made to the Société de Neurologie de Paris during the "Réunion Neurologique Annuelle" held in July, 1920. He gives the method of treatment he has adopted with consistently good results in cases of nervous localisations of the disease, and describes as follows the rule on which the treatment is based: "Considering an equal amount of novarsenical compound injected within the same period of time, if injections of small doses of the drug are given daily or every other day it is to be noticed that the security, the innocuousness and the effectiveness of the therapy is unequalled by the results obtained from weekly injections of large doses." This principle has apparently been adopted in many medical practices over here, but further communications upon the subject have yet to appear.

The Obtaining of Blood for Wassermann Tests.

MM. P. Nobécourt and H. Bonnet publish in the *Presse Médicale* of Oct. 30th an elaborate article upon this subject, basing their conclusions on observations of numerous cases. They insist that blood must be withdrawn when the patient's stomach has been empty since the previous day, and believe that results in the Wassermann reaction depend greatly on the observance of this point, having themselves noted that in two-thirds of the cases the serum from blood withdrawn during digestion contains substances which hinder complement-fixation. In the case of an infant the blood should be obtained at least six hours after feeding, during which time, however, some sugared water may be given without prejudice to the results of the Wassermann reaction. Mons. Parvu, in an article appearing in the same issue of the journal recommends that blood should be obtained from a vein, and condemns the practices—also employed in France—of finger-pricks and wet-cupping, since he has found that results may vary when the test is done simultaneously on two specimens of blood obtained, one from a vein, the other from a finger-prick, in the same individual. According to statistics such divergence occurs in 40 per cent. of the cases. Mons. Parvu thinks that the serum from blood obtained from a finger-prick or through wet-cupping may not contain all the substances necessary for complement-fixation owing to the presence of a certain amount of fluid due to interstitial œdema.

Non-Ureal Nitrogen and Symptoms of Uræmia.

Interesting statistics appear in a recent article by MM. H. Chabanier and A. de Castro Galhardo in the *Presse Médicale* of Sept. 18th. The writers consider certain uræmic symptoms to be due to nitrogenous substances other than urea in the blood plasma. Since Professor Widal's publication, "Les Grands Syndromes du Mal de Bright," the estimation of urea in the blood has been a common practice in France, even in cases of chronic nephritis, where the patient shows no obvious symptoms of uræmia. Where there is an excess of urea in the blood, prognosis and dietetic treatment are based on the rate of that excess, or on the ratio between the quantity of urea in the blood and the amount of this substance in the urine, this ratio being calculated according to Ambard's classical formula. Bright's disease with excess of urea in the blood, even when there are no symptoms of uræmia, is now diagnosed in France as Bright's disease with "azotémie"; a patient in this condition is called an "azotémique." In the estimation of urea obtained by treating the blood serum with hypobromite of soda, after removal of the proteins by precipitation, the quantity of urea is deduced from the amount of nitrogen (azote) given off by the action of hypobromite. In two communications made to the Société de Biologie, one by Mons. Moissonnier (Nov. 8th, 1919), the other by Mons. Laudat (May 15th, 1920), the results of investigations are given showing that in urea-estimation by means of hypobromite of soda the

whole of the amount of nitrogen given off does not entirely correspond to urea in the blood serum. Both this residual nitrogen and the ureal nitrogen are also given off using the method of Folin and Denis,[1] modified by Kjeldahl's technique, and after the proteins have been precipitated by trichloracetic acid, as recommended by A. Grigaut and F. Guérin.[2] On the other hand, Chabanier and Galhardo, in a communication to the Société de Biologie, May 15th, 1920, recommend Fosse's method with xanthydrol as a reagent for the accurate estimation of urea.

Having made use of these methods of investigation in about 50 cases, Chabanier and Galhardo give the results of their findings and a comparative study of the symptoms of their patients. Clinically they classify "azotémiques" into two groups: group A, patients having a pale complexion, complaining of nothing but an impaired appetite, and able to lead a relatively active life owing to a fairly good general condition; and group B, patients bedridden owing to marked asthenia, vomiting, and other symptoms due to obvious insufficiency of renal function; in the most serious cases the latter patients are more or less comatose. Patients of both groups may have a great amount of urea in the blood; its estimation may give 2 or 3 g. of urea, and even more, per litre of blood. In group A the amount of residual nitrogen is normal—i.e., 15 to 20 cg. per litre of blood. In group B the quantity of residual nitrogen is much greater than normally, amounting in most cases to from 40 to 50 cg. per litre of blood, and sometimes to more than 1 g. The writers have also noticed that when the condition of a patient of group A becomes aggravated the amount of residual nitrogen is increased; they record that death is always preceded by a marked increase of the residual nitrogen, and suspect that in cases of Bright's disease with "azotémie" the immediate cause of death is due to the excess in the blood plasma of constituents to which the residual nitrogen corresponds. Should further research result in this conclusion becoming accepted, the term "azotémie" might be Anglicised into "azotæmia" or "nitrogenæmia," and would in a good many cases be more appropriate than the term "uræmia."

Nov. 15th.

SWITZERLAND.

(FROM OUR OWN CORRESPONDENT.)

Death of two Distinguished Scientists.

DURING last week the Swiss medical profession has had to deplore two great losses. Both Professor von Bunge of Basle and Professor Théodore Flournoy of Geneva were known well beyond the Swiss frontiers.

Gustave von Bunge was born in 1844 at Dorpat, Russia. He came from an old stock of distinguished scientists and statesmen. After occupying for some time the post of privat-docent at his native university, he accepted in 1884 the chair of Physiological Chemistry at the University of Basle, which he held till his death. His research work was chiefly concerned with the metabolism of iron, the importance of salts in the food, and the composition of milk. All his original studies he embodied in his textbook of physiology which, by its clear and precise, almost classical, style revealed his great qualities as an ideal teacher who was able to rouse the enthusiasm of his scholars. Amongst these Abderhalden of Halle is the most famous. In the later part of his life Bunge was nearly entirely absorbed by his participation in the anti-alcohol movement. His lecture of 1884 on the alcohol problem became the classical pamphlet of scientific propaganda against the use of alcoholic drinks. It was translated into 20 different languages. But the abuse of alcohol was not the only social evil which he fought against; he extended his sphere to venereal diseases and to intoxication with tobacco. His mordant and acute pen and his fascinating personality made him a successful and redoubtable propagandist against social evils.

Théodore Flournoy, who studied medicine at Geneva and Strasbourg, became in 1891 professor of psychology at the University of Geneva. This chair had been especially created for him, and, according to his wish, allocated to the Faculty of Sciences. This marked a historical date in the history of psychology; for the first time psychology had been officially detached from philosophy and recognised as a science based on experiments. In a treatise which appeared in 1890 on "Métaphysique et Psychologie," he sharply outlined the frontiers of the new psychology. His first experimental works which he undertook in his psychological laboratory, a creation of his own, were concerned with the time of reaction, the feeling of weight, and promptly became classical. However, he abandoned soon his experimental work for simple observation. His interests were more and more directed towards such problems as hypnotism and double personality, that is, to phenomena which revealed the activity of the unconscious. In his "Phénomènes de Synopsie" (1893) he made allusion to the creative imagination of the unconscious, and in many points he was a precursor of the psycho-analytical school. In "Principes de la Psychologie Religieuse" he tackled the phenomena of religion from a psychological point of view. His last works were "Esprits et Mediums" and an admirable little book on the "Philosophie de William James." With Claparède, his successor, he founded in 1901 the *Archives de Psychologie*. In all his writings Flournoy revealed himself as a profound and original thinker. Of his native city, Geneva, he was an upright and loyal citizen.

Nov. 10th.

[1] Journ. of Biol. Chem., 1916, vol. xxvi., p. 491.
[2] Journ. de Pharmacie et de Chimie, April 16th and May 1st, 1919.

URBAN VITAL STATISTICS.

(Week ended Nov. 13th, 1920.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 18 million persons, the annual rate of mortality, which had increased from 10·7 to 11·8 in the four preceding weeks, further rose to 13·4 per 1000. In London, with a population of nearly 4½ million persons, the annual death-rate was 149, or 3·2 per 1000 above that recorded in the previous week, while among the remaining towns the rates ranged from 5·4 in Cambridge, 6·1 in Aberdare, and 6·5 in Smethwick, to 19·2 in Southend-on-Sea, 19·8 in Gloucester, and 21·7 in Hastings. The principal epidemic diseases caused 231 deaths, which corresponded to an annual rate of 0·7 per 1000, and comprised 106 from infantile diarrhœa, 67 from diphtheria, 24 from measles, 23 from scarlet fever, 9 from whooping-cough, and 2 from enteric fever. The deaths from diarrhœa, which had been 193, 185, and 129 in the three preceding weeks, further fell to 106, and included 29 in London, 7 in Liverpool, and 6 each in Stoke-on-Trent and Sheffield. The mortality from the remaining diseases showed no marked excess in any of the large towns. There were 5512 cases of scarlet fever and 2474 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, against 5373 and 2353 respectively at the end of the previous week. The causes of 37 of the 4583 deaths in the 96 towns were uncertified, of which 10 were registered in Birmingham, and 3 each in Liverpool and St. Helens.

Scottish Towns.—In the 16 largest Scottish towns, with an aggregate population estimated at nearly 2½ million persons, the annual rate of mortality, which had increased from 11·5 to 14·7 in the four preceding weeks, fell to 14·3 per 1000. The 319 deaths in Glasgow corresponded to an annual rate of 15·0 per 1000, and included 7 each from diphtheria and infantile diarrhœa, 3 from whooping-cough, 2 from scarlet fever, and 1 from measles. The 100 deaths in Edinburgh were equal to a rate of 15·3 per 1000, and included 1 each from scarlet fever, whooping-cough, and diphtheria.

Irish Towns.—The 134 deaths in Dublin corresponded to an annual rate of 16·8, or 2·1 per 1000 above that recorded in the previous week, and included 3 from infantile diarrhœa, 2 from diphtheria, and 1 from whooping-cough. The 112 deaths in Belfast were equal to a rate of 14·1 per 1000, and included 5 from infantile diarrhœa, 3 from diphtheria, and 2 from scarlet fever.

Dr. E. McConnel, J.P., has been appointed a Deputy-Lieutenant for the County of the City of Glasgow.

Correspondence.

"Audi alteram partem."

FAMINE-DROPSY: OBSERVATIONS ON TWO KINDS OF ŒDEMA.

To the Editor of THE LANCET.

SIR,—In the annotation on Famine-Dropsy and the War in your issue of Oct. 30th you mention various theories as to its causation, including that of Fischer,[1] who published a series of experiments indicating that œdema might be the result of the increased power of imbibition of water possessed by protoplasm when it becomes acid. During the course of some experiments I have obtained evidence of the existence of two modes of change to each of which the term œdema could be applied. They were distinguished by their differing actions on the functional capacity of the tissues. My experiments were performed on the perfused hind limbs of *Rana temporaria*, one limb serving for experiment and the other as control.

An œdema which may be called the œdema of acidosis was produced by causing the muscles to accumulate free acid through tetanus or by perfusion of lactic acid through the blood-vessels. Many years ago Ranke[2] showed that a fatigued muscle recovered its excitability if subsequent to the loss of excitability it were washed out by sending a saline solution through its blood-vessels. He also showed that lactic acid perfused through the blood-vessels produced fatigue phenomena from which there was recovery when the acid was likewise washed away. In both instances I found that this recovery was temporary, and that it was succeeded by a slow failure consequent on the development of an œdema. The œdema was a vital phenomenon because it eventually passed away on continuance of the perfusion, and as it passed away the capacity of the muscle to be excited to contraction once more returned. But the slightest trace of œdema brought about by this acidosis abolished the capacity of the muscle to be excited to contraction from its nerve.

Mosso[3] has shown, however, that a muscle can be excited to contraction by electrical stimulation of its nerve at a time when the central nervous system is no longer able to do so. Hence the finding that the slightest trace of the œdema of acidosis abolished the capacity of muscle to be excited by direct excitation of its nerve implies even more strongly the abolition of its capacity to be excited to contraction voluntarily. Hence also the finding that a patient can move voluntarily an œdematous limb can be taken as evidence that the œdema is not consequent on acidosis. I have seen many cases of famine œdema. They were "walking" cases. Had the œdema been due to acidosis they would have been bedridden.

There is also an œdema associated with perfusion. To produce it all that is necessary is to raise unduly the pressure of perfusion. A high grade of œdema can thereby be produced in half-an-hour. It goes away when the perfusion pressure is made normal again. In contradistinction to this the œdema of acidosis comes and goes at constant perfusion pressure, and can develop at zero pressure provided the tissue is in contact with sufficient fluid. A further important difference between the two kinds of œdema is that this œdema of perfusion has apparently no influence on the capacity of muscle to be excited to contraction either directly or through its nerve.

There are thus two kinds of œdema of similar external appearance, but showing marked differences of action on the functional capacities of the tissues in which they appear. There may be other kinds of œdema, and while we cannot definitely associate this œdema, due to too great perfusion pressure, with any definite pathological bodily œdema, we do get evidence for dissociating the œdema of acidosis from any such conditions.—I am, Sir, yours faithfully,

W. BURRIDGE, M.A., M.B., B.CH.

Physiological Laboratory, University of London, South Kensington, Nov. 4th, 1920.

[1] Fischer: Œdema, New York, 1910.
[2] Ranke: Tetanus, Leipsic, 1865.
[3] Mosso: Fatigue, London, 1900.

LAWRENCE *v.* EDMONTON COUNCIL.

To the Editor of THE LANCET.

SIR,—It may interest your readers to know how the matter of my appointment as supervisor of the maternity and child welfare centre has been at last settled between its medical officer of health and my Council. The terms are: (1) The deletion from the minutes of the resolution dated 24/6/19; (2) my reinstatement in office as supervisor from the aforesaid date at a salary of £100 and bonus yearly; (3) the payment to me of all arrears from June 24th, 1919; (4) the payment by the Council of all my legal expenses as between solicitor and client.

Of course, no money can compensate me for the worry and mental strain endured for 16 months or more owing to the arbitrary and illegal act of my Council. You perhaps know that in February last a nervous breakdown obliged me to take three months' sick-leave, and even now I have not fully regained my health. Throughout the long struggle I have been fortified by the sympathy and support of the local medical men, of the British Medical Association and its North Middlesex Division, of the National Association of Local Government Officers and its Edmonton Branch, and of the Society of Medical Officers of Health and the Society of Members of the Royal College of Surgeons of England. Many of my professional brethren have added their individual efforts to endeavour to obtain justice and fair play for me. To one and all I am deeply grateful. To them and myself the result, though long postponed, must be most gratifying, and we can all hope that it will be a stern warning to other local authorities that there are limits—legal, if other—to the inconsiderate treatment of their medical officer of health.

I am, Sir, yours faithfully,

SIDNEY C. LAWRENCE.

Town Hall, Edmonton, N., Nov. 7th, 1920.

THE HEREDITARY FACTOR IN TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—Dr. G. E. Beaumont, in THE LANCET of Nov. 13th, referring to the possibility of immunisation against tuberculosis by ingestion of infected cow's milk, asks me the following question: "Would this be a suitable means of immunising the children of London, or would the risk of mass infection be too great?" As this question is one of prime importance, I welcome the opportunity of making a very brief reply. Assuming that there is good ground for believing that bovine tubercle bacilli, ingested in milk, actually do lead in many cases to the acquisition of a relative degree of immunity to human tuberculosis, there can be no doubt at all that, if taken in large doses, they often lead to severe and even fatal infection. The investigations of Dr. Stanley Griffiths and others have shown, for instance, that tubercular meningitis is not infrequently caused by bovine bacilli. To my mind this fact settles the question. We have no right to advocate the deliberate exploitation of a method of immunisation which we cannot control and which we know to be fraught with danger if the dose happens to be excessive. The control of milk-supplies in such a community as ours is a very difficult matter, and, even if much greater success is attained than at present, it is unlikely that the children of London will be altogether deprived of opportunities of swallowing bovine tubercle bacilli. Let us hope that the doses may be so far reduced in the future as to remove at least all elements of danger. What I advocate is further research on methods of controlled immunisation. Perhaps it may, some time, become possible to use standardised doses of bovine bacilli in milk as a vaccine for oral administration. This is a line of work which invites careful experiment, but as to which exact

knowledge does not yet exist. For the moment we should, I think, strive for a pure milk supply, always provided that this can be attained without loss of the physiological value of the milk and without serious increase in its price.

I am, Sir, yours faithfully,

London, Nov. 14th, 1920. S. LYLE CUMMINS.

To the Editor of THE LANCET.

SIR,—In reading the interesting correspondence in your columns on this subject I am struck with the suggestion made by Professor Karl Pearson—viz., "It is immaterial whether the tuberculous diathesis be looked upon as an inheritance of susceptibility or an inheritance of disease, for both are but grades in the scale of immunity peculiar to the individual."

Your further article on Biometrics and the Procatarctic Causes of Tuberculosis encourages me to call attention to an article of mine, written some months since, collating the results of an investigation into this question, and at the moment in the press in the pages of *Tubercle*. Briefly, in preparing statistics here, covering a number of years, we found that less than 40 per cent. of our patients, after most careful investigation, had no family history of tuberculosis, including grandparents, uncles, and cousins as relations, and all undiagnosed chest conditions as tuberculous. Further investigation undertaken on the results of the treatment of patients, with and without family history, showed that those with family history had better results than those without. Analysis of the cases into groups, showing history of one, two, three, four, or more relations, compared with the average result of treatment for the same period, showed in each case results better in every group of those with history. These comparisons are illustrated by graphs in the article referred to.

The only conclusion I could make was that an hereditary immunity is developed, as occurs in other well-known diseases, both in Europeans and natives, and so well recognised in the pathologically closely allied disease, syphilis.

I am, Sir, yours faithfully,

Delamere Forest, Frodsham, Nov. 14th, 1920. A. ADAMS.

ELECTROLYTIC TREATMENT OF GONORRHŒA: A CORRECTION.

To the Editor of THE LANCET.

SIR,—In Mr. J. E. R. McDonagh's book on Venereal Disease, recently reviewed in THE LANCET (August 21st, p. 405), he describes the electrolytic treatment of gonorrhœa and gives opinions as to its value. I write to point out that the solution and technique there described were abandoned by me over three years ago. I published an account of the improved process in the *British Medical Journal* of May 12th, 1917.

I am, Sir, yours faithfully,

CHARLES RUSS, M.B. Lond., M.R.C.S.

Beaumont-street, W., Nov. 17th, 1920.

THE ERECTION OF LABORATORIES AT LOURDES.—At a recent meeting of the St. Luke's Catholic Medical Guild, which has nearly 400 members, it was agreed to support the efforts of Dr. le Bec, President of the French Medical Guild and the Medical Bureau at Lourdes, to establish bacteriological and radiological laboratories at Lourdes, so that the latest modern researches could be applied to the testing of alleged miraculous cures.

RESEARCH DEFENCE SOCIETY.—This society has lately published four pamphlets of general interest: (1) Vaccination, by Mrs. Scharlieb, M.D.; (2) the Prevention of Tetanus, During the Great War, by the Use of Antitetanic Serum, by Surgeon-General Sir David Bruce, F.R.S.; (3) the Work of the Medical Research Committee, by Sir Walter Fletcher, F.R.S.; (4) the Value of Experiments on Animals, Notes of Personal Experience, by Sir Leonard Rogers, F.R.S., I.M.S. The set can be obtained for 2*s.* from the secretary of the Society, 11, Chandos-street, Cavendish-square, London, W.1.

Medical News.

UNIVERSITY OF OXFORD.—The following awards of Theodore Williams Scholarships have been made:—In physiology: W. R. Bain, B.A., New College; in human anatomy: A. A. F. Peel, University College; in pathology: G. T. Kerr Cross, St. John's College.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At a meeting of Comitia of the Royal College of Physicians on Oct. 28th, and of the Council of the Royal College of Surgeons on Nov. 11th, diplomas of L.R.C.P. and M.R.C.S. were respectively conferred upon the following candidates (including 19 women) who have passed the Final Examination of the Conjoint Examining Board in Medicine, Surgery, and Midwifery, and have complied with the by-laws:—

F. F. Abdullah, St. Mary's; S. T. Barrett, Cambridge and Guy's; Ivy Constance Beach, St. Mary's; A. Bearblock, Univ. Coll.; F. Blake, St. George's; J. P. Bonfield, Kingston and London; A. B. Bratton, Cambridge and London; T. A. Brown, Oxford and St. Thomas's; O. G. Bryan, London; C. H. Bulcock, Manchester and St. Bart.'s; Joan Katherine Somerville Cave, Royal Free; G. H. A. P. Clavier, London; Florence Ruth Clulow, Univ. Coll.; S. Cohen, Guy's; Beatrice Lakeman Collins, Royal Free and St. George's; Elsie Eleanor Cowperthwaite, Royal Free and St. Mary's; E. J. Crisp, Guy's; A. Duffy, Manchester; F. H. Edwards, Liverpool; A. M. El Kirdany, St. Bart.'s; W. C. Elson, Leeds; Edith Marian Evans, St. Mary's; *H. Evers, Durham; E. C. Faraker, Guy's; A. J. Fenn, King's Coll.; J. O'F. Fletcher, St. Mary's; J. H. France, Westminster; Dorothy Gore, Royal Free; Madeline Giles, St. Mary's; F. R. Hall, St. Thomas's; C. K. J. Hamilton, Oxford and St. Thomas's; G. E. Hayward, Manchester; F. Hiam, Middlesex; J. T. S. Hoey, Oxford and St. Thomas's; Florence Janetta Humphreys, Westminster; Teresa Jadwiga Iyer, Royal Free; F. James, Charing Cross; T. T. Jones, Manchester; W. B. Jones, Univ. Coll.; Margaret Hypatia Kingsford, Royal Free; Doris Gertrude Knowles, Royal Free and St. George's; R. T. Lee, Sheffield; A. Leigh, Manchester; G. M. Lewis, Univ. Coll.; I. Lewis, Cardiff and Univ. Coll.; R. A. McCabe, Middlesex; F. S. Maclean, Cambridge and Middlesex; R. A. Madgwick, London; M. Maizels, Guy's; T. I. Makar, Westminster; G. E. Morgan, Oxford and London; T. S. Nelson, Oxford and St. George's; Eva Joyce Newton, Royal Free; Sybil Mary Nuttall, St. Mary's; T. D. Overend, Univ. Coll.; H. A. A. Pargeter, Cambridge and Guy's; C. L. Pasricha, Cambridge and St. Bart.'s; R. M. Patterson, Dublin and Guy's; A. S. Pearson, Birmingham; Winifred Catherine Piggott Royal Free; A. D. Porter, Cambridge and King's Coll.; Mary Colegrave Prideaux, Royal Free and St. Mary's; Norah Katharine Priestley, Royal Free; C. M. Probert, Guy's; A. M. Ramzy, Cairo and Charing Cross; B. N. Rau, Madras; J. J. Redelinghuys, Univ. Coll.; W. Remington, Guy's; J. S. Robinson, Manchester; W. G. Rose, St. Mary's; E. T. Saravanamuttu, Madras and Edinburgh; F. V. Squires, Cambridge and St. Thomas's; P. Steinberg, London; A. Sudki, Birmingham; S. C. Swinburne, Edinburgh; G. W. Theobald, Cambridge and St. Bart.'s; C. J. Thomas, St. Thomas's; C. J. Tjon-A-Man, Middlesex; *F. A. van Coller, Manchester; A. R. Walker, Cambridge and St. Thomas's; Nellie Wall, Liverpool; K. T. K. Wallington, Univ. Coll.; R. Weaver, Belfast; A. D. Whitelaw, St. Thomas's; Octavia Margaret Wilberforce, Royal Free and St. Mary's; V. Wilkinson, Cambridge and Univ. Coll.; E. F. Wilson, Guy's; Grace Elizabeth Winn, Royal Free and St. Mary's; F. B. Yonge, Middlesex; and J. E. Zeitlin, London.

* Diploma of M.R.C.S. conferred on Oct. 14th.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At the special and ordinary Primary Examination for the Fellowship, held from Nov. 2nd to 13th, 166 candidates presented themselves, of whom 71 were approved and 95 were referred. The following are the names and medical schools of the successful candidates:—

B. V. Abhyankar, Bombay and Middlesex; J. G. Ackland, St. Bart.'s; K. B. Bellwood, Cambridge and St. Bart.'s; A. C. Biggs, Univ. Coll.; D. M. Blair, Glasgow; W. H. Bleaden, Oxford and St. George's; Alice Bloomfield, Edinburgh; R. Brooke, Guy's; G. H. Caiger, Cambridge and St. Bart.'s; N. L. Capener, St. Bart.'s; D. S. Cassidy, Manitoba; R. B. Chandrachud, Bombay and Guy's; G. R. E. Colquhoun, Cambridge and St. George's; D. C. Corry, Univ. Coll.; R. Coyte, St. Bart.'s; J. M. Craig, St. Andrews and St. Mary's: H. E. Cumming, McGill and St. Mary's;; J. L. Davies, Cambridge and St. Bart.'s; O. De Muth, McGill; A. R. Dingley, St. Bart.'s; Doris Louise Durie, Univ. Coll.; G. S. Escoffery, Aberdeen and St. Mary's; G. J. St. C. Fisher, Otago and Middlesex; N. B. B. Fleming, St. Andrews and King's Coll.; Maud Frances Forrester-Brown, Royal Free; H. V. Forster, Liverpool; R. M. Fry, St. Mary's; R. A. H. Fulton, Otago and Middlesex; G. J. Gillam, Toronto and St. Bart.'s; Evelyn Elizabeth Gourlay, Royal Free; J. H. Gurley, St. Barts.'s; Margaret Constance Noel Hadley, Univ. Coll.; S. N. Hayes, Middlesex; A. H. Heslop, Durham and St. Thomas's; Nancy Mabel Hield and Dorothy Mary Howgate, Royal Free; W. Ibbotson, Sheffield, St. Thomas's, and Middlesex; R. Keene, St. Bart.'s; Dorothy Nelly Louise Leverkus, Royal Free; D. Levi, St. Mary's; L. A. Lewis, Edinburgh and St. George's; L. C. E. Lindon, Adelaide and Middlesex; F. Louis, Univ. Coll.; W. J. Lytle, Belfast and London; H. J. McCurrich, St. Bart.'s and St. Mary's; J. L. McDonald, Toronto and Middlesex; G. D. F. McFadden, Belfast and London; R. G. Michelmore, London and St. Mary's; L. J. Moir, Aberdeen and Middlesex; V. E. Negus, King's Coll. and St. Mary's; D. C. Norris, London

E. S. Page, Cambridge and St. Thomas's; B. H. Pidcock, St. Bart.'s; L. M. Rice, Toronto and Middlesex; G. D. Robertson, St. Mary's; A. W. L. Row, Oxford; E. L. K. Sargent, Cambridge and St. Thomas's; W. R. Spurrell, Guy's; F. A. R. Stammers, Birmingham; Doris May Stone, Royal Free; G. F. Stones, Sheffield; F. B. Sudbury, Cambridge; D. M. Sutherland, Manchester and Middlesex; T. M. Thomas, Cambridge; B. M. Tracey, St. Bart.'s; A. B. K. Watkins, London; B. W. Williams, Oxford and St. Thomas's; L. H. W. Williams, Cardiff and Univ. Coll.; E. Wolff, Univ. Coll.; R. S. Woods, Cambridge and St. George's; and H. W. Wookey, Toronto.

UNIVERSITY OF GLASGOW.—**The following degrees** were conferred on Nov. 13th:—

Doctor of Medicine (M.D.)—John Anderson (in absentia, with commendation), Harold Livingstone Coulthard (with commendation), Nicolas Gebbie, John Gibson, Alexander Glen (with commendation), Archibald Leitch (with honours), Allison David M'Lachlan (with honours), John Pearson M'Vey (with high commendation), Malcolm Manson (with high commendation), George Waugh Scott, and John Steedman (with commendation).

ROYAL FREE HOSPITAL APPEAL.—**A fair, organised** by the staff of the London (R.F.H.) School of Medicine for Women, will be held at this school, 8, Hunter-street, London, W.C., in aid of the Royal Free Hospital on Friday, Dec. 3rd, from 4 P.M. to 9.30 P.M. All past students of the school and hospital will be specially welcome.

MEDICO-LEGAL SOCIETY.—**The annual dinner of** this society will take place at the Holborn Restaurant on Friday, Dec. 10th, at 7.0 for 7.15 P.M. Tickets (price 14*s.* 6*d.*, exclusive of wine) may be obtained from the honorary secretary, Medico-Legal Society, 3, South-square, Gray's Inn, London, W.C. 1.

ITALIAN EXPEDITIONARY FORCE: MEDICAL OFFICERS' RE-UNION DINNER.—A successful re-union dinner of the medical officers who served with the Italian Expeditionary Force was held at the Royal Automobile Club, London, on Thursday, Nov. 11th, under the chairmanship of Col. J. V. Forrest, A.M.S. Among the guests present were Sir John Goodwin, Lord Monson, Sir Courtauld Thomson, and Cavaliere C. Samburetti, who spoke eloquently for the Friends of Italy movement. It was decided to have another re-union next year, the arrangements being left in the hands of the honorary secretary, Dr. C. Horsford.

CHELSEA CLINICAL SOCIETY DINNER. — **The** inaugural dinner of the twenty-fourth session of this society, the first to be held since the war, took place on Oct. 29th at the Café Royal, when 60 members and guests were present. Owing to a sudden bereavement Dr. A. G. Buchanan, the President, was unable to be present, and Dr. D. M. Barcroft, Vice-President, took the chair. The guests of the society were the Vice-Chancellor of the University of London and the Presidents of the Medical Society of London and the Harveian Society. In his reply to the toast of "The Guests," the Vice-Chancellor said that the University of London was often considered as a medical University, but that the vast scope of the University was not generally recognised, few realising that it possessed over 1000 teachers and that the number of graduates was three times that of other universities of England and Wales. He remarked that the salient characteristic of the University was hospitality, and that all were welcome, irrespective of creed, sex, or sect. He hoped that in the near future they would possess buildings worthy of the University and of which London might be proud.

NORTH-EAST LONDON POST-GRADUATE COLLEGE.—A special post-graduate course is to be held from Monday, Dec. 6th, to Saturday, Dec. 18th, inclusive. At 10.30 A.M. and at 11.45 A.M. each day practical demonstrations will be given on the more important clinical and laboratory methods applied to medical practice. In the afternoons demonstrations will be given at 2 P.M. on groups of selected cases and special subjects. The hour from 3 to 4 will be devoted to the general practice of the hospital, and at 4.30 P.M. clinical lectures will be delivered by Sir Thomas Horder, Dr. W. H. B. Stoddart, Dr. John Eyre, Lieutenant-Colonel H. Kirkpatrick, Dr. Philip Manson-Bahr, and others; on two afternoons clinical consultations on obscure medical and surgical cases will be held. On Saturdays demonstrations will be given on the early diagnosis of the infectious fevers at the North-Eastern Fever Hospital, St. Ann's-road, London, N.; on dementia præcox at the L.C.C. Mental Hospital, New Southgate, London, N.; and on the electro-cardiographic examination of cases of heart disease at the Royal Hospital for Diseases of the Chest, City-road, London, E.C. Luncheon will be obtainable in the neighbourhood of the hospital and tea will be provided each day at 4 P.M. The lectures at 4.30 P.M. will be free to qualified medical practitioners. Further information and syllabus of the course may be obtained from the Dean of the College at the Prince of Wales's General Hospital, Tottenham, N. 15.

LITERARY INTELLIGENCE.—**Messrs. J. and A.** Churchill will shortly publish a new and greatly enlarged edition of "Poverty and its Vicious Circles," by Dr. J. B. Hurry.—Messrs. Christophers announce that they will publish on Nov. 22nd "A Consulting Surgeon in the Near East," by Colonel A. H. Tubby.

HARVEIAN SOCIETY OF LONDON.—**The programme** for the second half of the eighty-ninth session has now been issued. On Thursday, Dec. 16th, at 8.30 P.M., a discussion on the Future of the Poor-law Infirmary will be introduced by Dr. C. M. Wilson and Dr. Charles Buttar, followed by Mr. E. W. Morris, house governor at the London Hospital, and others. On Thursday, Jan. 13th, at 8.30 P.M., at the annual general meeting, an address will be given by the retiring President, Dr. W. Hill, on the Great Advances in the Investigation and Treatment of Diseases of the Œsophagus during the Present Century, illustrated by lantern slides. The temporary meeting-place of the society is at the rooms of the Medical Society of London, 11, Chandos-street, W.

CHADWICK PUBLIC LECTURES.—**On Nov. 25th, at** 5.15 P.M., at the Medical Society of London, 11, Chandos-street, Cavendish-square, London, W., Professor J. B. Farmer, F.R.S., will lecture on Some Biological Aspects of Disease, Sir William J. Collins presiding. At 7.30 P.M. on Dec. 3rd, at the Lord Mayor's Parlour, Town Hall, Manchester, Sir Malcolm Morris will lecture on Chadwick and his Message for To-day, under the presidency of the Lord Mayor of Manchester. On the same date, at Newcastle-on-Tyne, Surgeon Rear-Admiral Sir Robert Hill will lecture on Naval and Maritime Hygiene in Relation to Shipbuilding, at 7.30 P.M., at the Lecture Theatre, Literary and Philosophical Society; Mr. A. E. Doxford, President North-East Coast Institution of Engineers and Shipbuilders, will preside. On Dec. 7th, at 8 P.M., Mr. Alexander Macmorran, K.C., will lecture on Some Legal Difficulties in Connexion with the Provision of Water-supplies in Rural Parishes, at the Lecture Room, Royal Sanitary Institute, Buckingham Palace-road, London, S.W., Mr. W. Addington Willis in the chair. Admission will be free to these lectures. Further particulars of Chadwick Lectures may be obtained from the secretary, at the offices of the Chadwick Trust, 13, Great George-street, Westminster, London, S.W. 1.

LONDON SCHOOL OF TROPICAL MEDICINE.—**The new** premises of the London School of Tropical Medicine in Endsleigh-gardens, Euston-square, a Red Cross gift, were opened by the Duke of York on Nov. 11th. A mural tablet of record in the entrance hall, and a tablet to the memory of the late General Sir Stanley Maude were unveiled. Lord Milner described the school as one of the greatest achievements of private munificence. At the close of the war it was found desirable to move the school, founded during the colonial secretaryship of Mr. Joseph Chamberlain, from Poplar to the new site, and £100,000 had been received from the Red Cross for the purpose. Public subscription had realised £100,000 towards the additional £150,000 required; the balance was expected from the rich corporations and individuals interested in tropical development. The Duke of York, in declaring the building open, paid a tribute to all who had assisted in building up the great tropical dependencies of the Empire, and to the scientists who had given their lives in the cause. "It is the first duty of a civilised community," he said, "to provide the conditions of a healthy life, to sweep away the plague spots, to take measures against infection, and, possibly most important of all, to instruct the public as to habits of life which make for health." The School of Tropical Medicine holds a watching brief for the health of the outposts of the Empire.

FINANCIAL POSITION OF NEWCASTLE COLLEGES: £500,000 REQUIRED.—Under the chairmanship of the Duke of Northumberland, a meeting was held on Nov. 11th at Newcastle to discuss the means of raising the funds so urgently needed by Armstrong College and the College of Medicine. The chairman said that the two colleges were in a most serious financial situation. No more money could be obtained from the Treasury, and fees could not be increased. The only alternative was to raise money by public subscription. Dr. D. Drummond, President of the College of Medicine, explained the position so far as that institution was concerned. The site upon which the College stood was too small to permit of the extension necessary to enable the council to meet requirements. There were between 400 and 500 students, including 70 women. He urged that means should be forthcoming to enable the council to keep pace with the best-equipped colleges in the country. The last balance-sheet showed a deficit, and there was every probability of the next one doing the same. The amount wanted for both Colleges is £500,000, of which one-quarter is required for the College of Medicine.

HUNTERIAN SOCIETY.—A clinical meeting will be held at Guy's Hospital on Wednesday, Nov. 24th, at 4 o'clock, when the following demonstrations will be given:—Mr. Joffe: Pathological Specimens. Dr. Ryle: Methods and Results of Fractional Gastric Analysis. Mr. Kelsey Fry: Prosthesis as an Aid to Surgery, with clinical cases. Mr. Todd: Orthopædic Appliances, and Stages in Splint-making. Dr. Hunt: Methods of Administering Oxygen, with demonstration of a new oxygen chamber. Clinical cases will be shown by: Dr. Symonds, Dr. Mutch, Dr. Barber, Mr. Hughes, Mr. Slesinger, Mr. Bromley, Mr. Cook, Mr. Tanner, Mr. Kelsey Fry, and others.

R.A.M.C. MEMORIAL AT BRISTOL.—On Nov. 13th a tablet in memory of the non-commissioned officers and men of the 1/3rd South Midland Field Ambulance who fell in the war was unveiled at the unit's headquarters at Colston Fort, and on the following day a memorial service was held at the Temple Church.

BRISTOL MEDICO-CHIRURGICAL SOCIETY. — On Nov. 10th the University of Bristol Speleological Society gave to a meeting of the Bristol Medico-Chirurgical Society an account, illustrated by specimens and lantern slides, of some of its recent work in the Mendip caves. Professor Edward Fawcett described the palæolithic remains found in a cave at the foot of Burrington Coombe. One skull, of a dolicho-cephalic type, was almost complete, and there were fragments of other brachycephalic skulls. It was the association of these types of skulls with each other, and with certain microlithic flint tools, found in the same cave, that led Professor Fawcett to place these remains in the late Palæolithic or Azilian period. Mr. L. S. Palmer, M.Sc., next described the early British remains found in another of the Mendip caves, the newly discovered Keltic Cavern. The only human bones found so far were a radius and portions of a scapula and of a femur. All the animals whose bones lay in this cave were of domesticated types.

WELSH BRANCH OF SOCIETY OF M.O.H.'S.—A meeting was held in the City Hall, Cardiff, on Nov. 12th. Members were present from various parts of the Principality. Business in connexion with the society was transacted, and an address was given by Dr. E. L. Collis, Mansel Talbot Professor of Preventive Medicine, on the Importance of Industrial Medicine to the Public Health Service.

WELSH NATIONAL SCHOOL OF MEDICINE.—The new Charter of the University of Wales has, as was expected, determined that the medical school is to be located at Cardiff, attached to the University College of South Wales and Monmouthshire. The management of the school is to be entrusted to a board of medicine and a faculty of medicine; these two bodies will be formed during the next few months. Development of the school by establishing a complete course of education—up to the present it has ceased at the anatomy and physiology stage—has received a further impetus from the appointment of the first professor of tuberculosis. The chair is to be known as the David Davies professorship, named after the grandfather of Major David Davies and his two sisters, who have endowed it. The new professor is Colonel S. Lyle Cummins, now professor of pathology to the Royal Army Medical Corps at Millbank. In addition to being professor of tuberculosis he is also to be principal medical officer to the King Edward VII. Welsh National Memorial (Tuberculosis) Association. The position he will thus occupy will be unique in the field of tuberculosis. The entry of students this year, now that the influx of ex-Service students is over, has fallen considerably, and is between 50 and 60, but the teaching accommodation of the anatomy and physiology departments is now feeling the strain of the large entries of 1918 and 1919. The students last year formed a scientific society, and on Nov. 9th the new session was inaugurated by Dr. William Brown, who delivered an address on Psychotherapy to an enthusiastic audience.

VOCAL THERAPY SOCIETY.—The second anniversary meeting of this society was held on Nov. 11th at 52, Portland-place, London, the house of Lady St. Helier, when Lieutenant-Colonel Sir Frederick Mott gave an address on the Influence of Music on Body and Mind. He said that musical memory returns earlier than the power of recollecting past experiences. Soldiers suffering with shock were able to remember and sing songs or play pieces they had learnt before the shock, and yet were unable to remember experiences connected with their daily avocations and home surroundings. Again, men who were mute from the same cause might at a concert suddenly regain their speech by joining in the chorus of some well-known song. Probably words associated with music were more stably organised in the mind owing to the musical origin of the language of the emotions. There was reason to suppose that the utterance of vocal inarticulate sounds of varying pitch was, in evolution, much older than articulate speech, and that whereas the production of such sounds could be initiated in both halves of the brain articulate language in right-handed persons could only be initiated in the left half, which controlled voluntary movement of the right half of the body. Sir Frederick Mott quoted a case of a soldier who had right-sided paralysis and aphasia following on a wound in the left side of the brain, but who was able to sing several well-known songs, provided the first word or bar of music was given. Sir Frederick Mott concluded that the song had been repeated so often as to have become organised in both halves of the brain or in subcortical lower centres. The aims of the Vocal Therapy Society are the promotion through speech, song, and efficient breathing of the physical and mental health of sick, wounded, and disabled service men and the adoption of the most effective methods of individual and class training. The society also undertakes to train voluntary and paid teachers. The hospital and other ex-service singers are formed into choirs called the King's Service Choir, and under the auspices of the society an excellent concert was given at the Philbeach Hall, Earl's Court, London, W., on Nov. 13th. Subscriptions to the Vocal Therapy Fund may be sent to the honorary treasurer, Mr. H. E. Bury, 47, Lincoln's Inn Fields, W.C. 2, or the Honorary Secretary, 32, Charles-street, Mayfair, London, W. 1.

WATER-SUPPLY OF PLYMOUTH.—Although the storage of the Burrator Reservoir has a capacity of 7,000,000,000 gallons of water, expert opinion shows that this is not sufficient; consequently the Plymouth Town Council has decided to increase the capacity by 326,000,000 gallons. The estimated cost is £127,864.

VACCINATION AT MIDDLETON.—The total number of small-pox patients under treatment in the Middleton outbreak is 57, and seven of the earlier cases have been discharged. Queues have been formed during the last few days at the public vaccinator's office, and some 3000 persons have been vaccinated. The outbreak has led to the closing of day schools and Sunday schools. The children who frequent kinemas must stay at home, and the mayoral procession on Sunday was cancelled. For several days no new cases were reported, but on Nov. 11th two children were found to be infected. The appeal issued for the suspension of public meetings has been loyally observed. In the opinion of the medical officer of health three or four weeks should elapse without the occurrence of any fresh cases before normal intercourse and the social activities of the town are resumed.

A VENEREAL POSTER.—We understand that the poster regarding venereal disease referred to in THE LANCET of Oct. 16th, p. 813, which was criticised by a Manchester society, has been the subject of communication between the Manchester Public Health Committee and the Ministry of Health. The Ministry objected to the poster being displayed in the public urinals, and the Committee has decided to issue a revised edition of the poster emphasising the moral aspect of the question.

MANCHESTER AND DISTRICT RADIUM INSTITUTE'S APPEAL.—An appeal for £30,000 on behalf of this institute has been issued, pointing out that the gift of a furnished and equipped hospital by Sir Edward and Lady Holt would enable the institute to cope with the large and increasing number of patients requiring relief and afford requisite facilities for continuing and extending their beneficent work. Already Manchester has expended nearly £30,000 for its 1100 milligrammes of radium, but it is felt that this amount ought, at least, to be doubled, hence the appeal. Since its institution six years ago its patients have numbered 2934. It is encouraging to learn that in inoperable cases of cancer treated something like 10 per cent. at the end of twelve months are free of symptoms, and some for a longer period. It would appear also that 50 per cent. of cases of rodent ulcers are cured. Under the new conditions part of the funds may be required for upkeep.

MANCHESTER'S IMPROVED HEALTH STATISTICS.—The annual report (1919) of the medical officer, Dr. J. Niven, shows that despite an outbreak of influenza, which caused 1127 deaths, the general death-rate—the lowest yet recorded—was 13·73 per 1000, the total deaths being 10,854. There was a fall in the death-rate from tuberculosis, pneumonia, and diarrhœa, but the deaths from cancer were 875, an increase of 69 over 1918. For the first time the infant mortality-rate fell below 100 per 1000 births, or about half what it was in 1890–92, thus marking a great advance. A special section of the report is devoted to the influence of occupations on health, with special reference to the conditions obtaining in Manchester, the occupational mortality, it is found, being profoundly influenced by the environment of the workers. Another chapter deals with the condition of the atmosphere and with suggested means of mitigating or getting rid of the smoke from coal-fires and chimneys of public works. A particularly interesting part of the report is Dr. Niven's exposition of the types of work which lead to intemperance.

ROYAL SOCIETY OF MEDICINE: SECTION OF TROPICAL MEDICINE.—The first scientific meeting of this new section of the Society will be held at the House of the Society, 1, Wimpole-street, London, W.1, on Tuesday, Nov. 30th, at 5 P.M., and after the brief formal business a short paper will be read by Dr. F. G. Rose on the Incidence of Filariasis in British Guiana, giving a résumé of work done under the auspices of the Colonial Office. This will be followed by some exceptionally interesting demonstrations. The President and Council desire that this first meeting should be well supported, and hope that all interested will try to be present and if disposed take part in the proceedings. The latter intention should be intimated to Sir John MacAlister, secretary of the Society.

ROYAL SOCIETY OF ARTS.—Dr. F. W. Edridge-Green will lecture on Colour Vision and Colour Blindness, with lantern views of pictures by colour-blind persons, on Wednesday, Nov. 24th, at 8 P.M. Sir Philip Lloyd-Greame, Parliamentary Secretary to the Board of Trade, will preside.

THE LEBANON HOSPITAL FOR MENTAL DISEASES.—The annual general meeting will be held at the rooms of the World's Evangelical Alliance, 19, Russell-square, London, W.C., on Wednesday, Nov. 24th, at 3 P.M., Dr. R. Fortescue Fox in the chair, when Dr. R. Percy Smith and Dr. E. W. G. Masterman are expected to take part. The London office of the hospital is at 35, Queen Victoria-street, E.C. 4.

CHILDREN'S JEWEL FUND.—Of the two memorials to the Fund in London, one for the benefit of maternity is to take the form of the endowment of a maternity ward at Queen Mary's Hospital for the East End; the other, for infant welfare, the endowment of a scheme for treating infants suffering from malnutrition, a class of case which, under existing conditions, is inadequately provided for at children's hospitals. For each of these schemes the Children's Jewel Fund is making an immediate grant of £3500, a sum which it is hoped greatly to augment as soon as the assets of the Fund have been realised.

SOCIÉTÉ DE THÉRAPEUTIQUE DE PARIS.—At a recent meeting of this society Dr. R. Huerre read a paper in which he proposed replacing oil of cade by a solution of pyrocatechin, guaiacol, methyl-, ethyl-, and propyl-guaiacol in a mixture of the essential oils of cade and cedar wood. In a paper on Metallic Sulphur Derivatives in Therapeutics Dr. Auguste Lumière reported how he had succeeded in preparing organic and inorganic sulphur derivatives. The latter were much the more stable. Thiosalicylate of silver and sodium, which was very soluble in water, contained 30 per cent. metallic silver, was not precipitated by chlorides or chromates, was not affected by light, did not stain the tissues, did not possess the metallic taste of silver salts, had no irritating properties, and though only slightly toxic possessed very energetic antiseptic properties. Dr. G. Monod, of Vichy, reported a case of Aerophagia in a young officer who was about to be discharged from the army as a case of heart disease when the real condition was found to be aerophagia, which was cured in the ordinary way. Dr. A. Robin and Dr. M. Pierre-Weil read a paper on the Therapeutic Action of Theobromine and Saccharose on Certain Varieties of Bronchial Secretion. They reported three cases of patients whose cough and profuse expectoration suggested pulmonary tuberculosis. Under the influence of theobromine and saccharose, however, the bronchial secretion dried up and normal diuresis was re-established. Dr. H. Bourges and Dr. A. Marcandier read a paper on the Treatment of Epidemic Encephalitis, in which they recommended during the acute stages of the disease bactericidal treatment such as urotropine and arsenious acid, and the increase of the natural defences of the organism by the early production of a fixation abscess. In subacute and protracted forms they stated that they had derived good results from auto-hæmotherapy.

LIVERPOOL MEDICAL INSTITUTION.—A meeting was held on Nov. 11th, Dr. J. E. Gemmell, the President, being in the chair. Mr. G. C. E. Simpson read a note on Anthrax. After noting the symptoms and treatment, he described the cure of 12 consecutive cases, 6 of them manifesting severe constitutional symptoms in addition to the pustule. In each case from 20 c.cm. to 500 c.cm. of anthrax serum was injected in cumulative doses. Excision with carbolisation was performed in three cases. In some the sore was dressed with glycerine of biniodide of mercury. In one there was apparently dry gangrene of a finger, with extensive streptococcal infection of hand and arm, and pending bacteriological investigation amputation of finger and incisions of hand and forearm were performed. Generally the temperature fell in the course of a few hours to six days. Occasionally a slight rise followed the injection, in some cases the fall was by crisis with collapse, and a very slow pulse. One patient's condition was acute for several days, and 440 c.cm. of serum was given subcutaneously in 120 hours before improvement supervened, the subsequent slough measuring 3 inches by 2 inches, and involving malar region and both eyelids. One patient, a farmer, developed multiple pustules in the arm and œdema of the chest after cutting up the carcass of an infected beast, and on the third day of treatment appeared moribund, with vomiting, severe diarrhœa, and melæna; 380 c.cm. was injected in 96 hours, and he was discharged with wounds healed on the twenty-fifth day. In these two cases the first dose of serum was given intravenously. The farmer when apparently moribund rallied after 90 c.cm. of serum intravenously on the eleventh day, temperature and pulse falling to normal after a further 310 c.cm. subcutaneously. The œdema of arm and chest resolved on the sixteenth day. He was treated by eusol baths for the streptococcal infection, the subcutaneous gangrene having spread to the middle of the upper arm. Mr. Simpson was convinced that the present 15 per cent. mortality could be abolished by the use of anti-anthrax serum. The intravenous route was of value for urgent cases. Excision was rarely called for in unmixed anthrax; it merely delayed cure and added to the risk of transmission of infection. Dr. Burton Robinson read a paper on the Sun Cure in the High Alps, dealing with pulmonary and surgical tuberculosis as treated at Leysin, and illustrated by lantern slides. The Rollier Clinics for surgical tuberculosis showed remarkably interesting and good results. The pictures of cases before and after treatment bore witness to complete reconstitution of the general health and at the same time consistently good recovery of function in spondylitis and other articular tuberculosis, as also in adenitis and peritonitis. The importance of methodical insolation and full pigmentation was emphasised.

THE LATE DR. G. C. PARNELL.—Mr. Gerald Crecy Parnell, M.R.C.S. Eng., who died on Nov. 4th at his residence at Forest Hill, was consulting surgeon to the Home and Infirmary for Sick Children, Lower Sydenham. Qualifying in 1871, he became house surgeon at St. Bartholomew's Hospital, where he received his medical education, and afterwards held a similar appointment at the Worcester General Infirmary. In 1876 he entered on general practice at Forest Hill, and was appointed medical officer to the local dispensary.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surgeon Lieutenant Commanders to be Surgeon Commanders: F. G. Hitch, T. R. L. Jones, J. H. Burdett, F. G. H. R. Black, A. V. J. Richardson, G. R. McCowen, and W. Bradbury.

ROYAL ARMY MEDICAL CORPS.

Lieutenant-Colonels retiring on retired pay: J. H. Campbell, J. Grech, and F. Harvey.

The undermentioned relinquish the acting rank of Lieutenant-Colonel: Major and Brevet Lieut.-Col. C. H. Turner, Major T. J. Wright, and Temp. Capt. F. R. Kirkham.

Majors retiring on retired pay: A. B. Smallman and H. W. Long (granted the rank of Lieutenant-Colonel), A. W. A. Irwin, and F. A. Stephens.

Major R. G. G. Anderson retires receiving a gratuity.

The undermentioned relinquish the acting rank of Major: Capts. W. E. Adam, H. R. L'Estrange, and S. D. Robertson.

Capt. J. H. Spencer to be Major.

The undermentioned Captains retire receiving a gratuity: I. R. Hudleston (granted the rank of Lieutenant-Colonel), S. J. Higgins and S. H. Smith (granted the rank of Major).

The undermentioned late temporary Captains to be temporary Captains: T. Brodie and B. N. Sinclair.

Lieut. (temp. Capt.) W. S. Gross resigns his commission and is granted the rank of Captain.

Officers relinquishing their commissions:—Temp. Major H. M. Rashbrook (on ceasing to be employed with the Edmonton War Hospital, and retains the rank of Major). Temp. Capt. A. W. Wilcox (granted the rank of Major). Temporary Captains retaining the rank of Captain: T. F. Griffin, C. E. A. Trow, F. Dugon, and H. D. Gasteen.

TERRITORIAL FORCE.

Major L. A. Avery to be Deputy Assistant Director of Medical Services, East Anglian Division.

Major A. W. Anderson resigns his commission and is granted the rank of Lieutenant-Colonel.

Capts. A. P. Watson, J. McHoul, G. F. Haycraft, and F. W. B. Young to be Majors.

Capt. A. J. Blaxland resigns his commission and is granted the rank of Major.

Capts. I. G. Bisset, J. Saffley, and J. P. I. Harty resign their commissions and retain the rank of Captain.

ROYAL AIR FORCE.

Wing Commander L. L. Greig is placed on the retired list at his own request.

Capt. L. S. Goss (Surgeon Lieutenant, R.N.) relinquishes his R.A.F. on return to the Royal Navy.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

The Tuberculosis Bill.

Dr. ADDISON informed the House of Commons on Monday that it was only proposed to proceed this session with so much of the Public Health (Tuberculosis) Bill as was needed to continue the existing arrangements from Jan. 1st next. The provisions of the National Health Insurance Act, passed in May last, made this inevitable. He added that the Ministry of Health was trying to overcome the inadequacy of sanatorium accommodation under existing conditions. The Public Health (Tuberculosis) Bill, it will be remembered, makes it the duty of county authorities to provide within their areas for the treatment of tuberculosis in a manner to satisfy the Ministry of Health, and in default of such provision empowers the Ministry to carry out the work at the expense of the county authority.

HOUSE OF COMMONS.

WEDNESDAY, NOV. 10TH.

Pensions Appeal Tribunal.

ON the motion for the adjournment of the House,

Mr. NEWBOULD said the House knew that the final tribunal in all matters of pensions was the Statutory Appeal Tribunal appointed by the Lord Chancellor. The Minister of Pensions had no control over this tribunal, and in raising this question he was therefore not criticising the Department. He wished, however, to bring some pressure to bear through the House on the Ministry or on the Prime Minister in regard to the inquiry which was now taking place into the machinery and administration of the Ministry of Pensions. He asked that that inquiry should be extended to bring within its scope the Lord Chancellor's Appeal Tribunal, and he did so on four grounds. First of all on the ground of delay; secondly, on the ground of decision; thirdly, on the ground of justice to the Ministry, who were blamed for the deficiencies of the Appeal Tribunal, if there were any; and fourthly, on the ground that any inquiry into the administration of pensions was not complete unless it comprised the whole of the machinery. There was one very good reason why delay in this matter, if avoidable, should be avoided, and that was that this Appeal Tribunal was not reached until all the other processes had been exhausted. It often took 6, 9, or even 12 months to exhaust all the other questions, and in the process of exhaustion the patience of the applicant was exhausted also. He wished to refer to the class of case in which there was a conflict of medical testimony—i.e., where the applicant had medical certificates from specialists which were at variance with the verdict of the medical officers of the Ministry or the tribunal. He wanted to give one case over which he had had an enormous amount of correspondence with the Ministry—the case of Lieutenant Robinson. This man joined the Regular army in 1894, and at the end of three years' service he extended it to 12, and, of course, was medically examined and found fit. At the end of 12 years he again extended it to 21, and was again medically examined and found fit. He was also medically examined on many other occasions when he went on active service, both in Egypt and in India. He completed 21 years' service with the colours on Oct. 23rd, 1916, in the middle of the Great War, and took his discharge; but owing to the appeals that were then being made he joined up again almost immediately as an A 1 man, and served for the remainder of the war. He was discharged at the end of the war as a C 3 man through deafness, and he had been refused a disability pension, having gone right through all the processes and finally through the Lord Chancellor's Appeal Tribunal, on the ground that the deafness was not attributable to, or aggravated by, military service. This man was passed A1 in 1916 and was now very deaf, and yet he was told that it was not attributable in any sense to military service. He had gone to the trouble and expense of seeing various specialists. He had a certificate from a well-known Wimpole-street specialist stating in effect that the deafness was in his opinion attributable to military service. He had two other certificates to the same effect from the assistant surgeon to the London Ear, Nose, and Throat Hospital, and another from the surgeon of the Westminster Hospital for Diseases of the Ear and Throat. This man would never be satisfied with the result. He maintained that in cases of this sort the man should have the benefit of the doubt.

Major TRYON (Parliamentary Secretary to the Ministry of Pensions) said all he could say at the moment about the case of Robinson was that it was clearly a case which was examined on its merits by the Ministry and he was not considered entitled to a pension, and afterwards this case was tried by an impartial independent tribunal and they agreed with that decision. The honourable Member was anxious that the inquiry should include the working of the independent tribunal. He could not accede to that request, because it was a Departmental Committee set up by the Minister himself with the object of doing everything within the working of the Ministry to improve the machinery. He could not set up a Departmental Committee to inquire into the proceedings of a body set up by the House of Commons over the Ministry and independent of the Ministry. The cases when they reached the tribunal were settled on an average within a month, which was about the time that it took the county court to deal with somewhat similar cases under the Workmen's Compensation Acts. The inquiry would include all delays so long as they were in the control of the Ministry. With regard to the whole position of the independent tribunal, there had been misunderstanding not only in the country, but even among Members of the House. It was not fair that after this tribunal had been made independent of the Ministry by the House that they should be blamed for proceedings entirely outside their control. During the last six months of 80 cases—difficult most of them—they granted 60 straight off. That left 20 unsettled, and of those 20 remaining 17 of the applicants accepted the decision and did not appeal; but three did appeal, and of them one was successful. The fact that this independent tribunal had not changed the results was not a fault of the tribunal, but was a tribute to the justice which had already been done. He thought the men ought to have confidence in these tribunals. They consisted of a barrister or solicitor of seven years' standing, selected by the Lord Chancellor, and a medical man specially selected for the work. That was a point not sufficiently known.—Mr. PENNEFATHER: How many tribunals are there?—Major TRYON said there were 13 now, and there would soon be an additional one for Scotland. He suggested that what was wanted was not a change in machinery, but if any part of the country was getting behind with its appeal cases the simple thing was to add another tribunal.

New Medical Record Cards.

Brigadier-General COLVIN asked the Minister of Health if he would state the cost involved in preparing, printing, and issuing to insurance committees the new medical record cards to be kept by insurance practitioners after Jan. 1st, 1921; the estimated expenditure of insurance committees for writing the record cards and supplying the cards to the practitioners; and the estimated annual expenditure of carrying out the proposed procedure in the transmission of record cards in the cases of persons removing from one district to another.—Dr. ADDISON replied: The estimated initial outlay for England and Wales on the new permanent medical records is, under the first part of the question, £38,000, and under the second part £19,000. With regard to the third part, it is not possible to give a reliable estimate of the yearly cost of transmission of the record cards, but it should fall considerably short of the annual expenditure on the old medical record cards and doctors' register cards, both of which will be replaced by the new permanent medical record card.

THURSDAY, NOV. 11TH.

Remuneration of Borough Coroners.

Mr. THOMAS-STANFORD asked the Home Secretary whether he was aware that the position of borough coroners was at present very unsatisfactory, and that while other officials engaged in work of a somewhat similar character had had their salaries increased to meet the greater cost of living, borough coroners were still paid by fees which, in the circumstances, were inadequate; and whether he proposed to bring in a Bill to carry into effect the recommendation of a Home Office committee which reported in favour of borough coroners being paid by salary over ten years ago.—Mr. SHORTT replied: I hope to introduce a Bill dealing with this point and others affecting coroners, but it will not be possible to do so this session.

Ministry of Health Bill and Ireland.

Major O'NEILL asked the Chief Secretary for Ireland if he could say whether any of the provisions of the Ministry of Health (Miscellaneous Powers) Bill affected Ireland.—Sir HAMAR GREENWOOD replied: The Bill as introduced applies to Ireland, but in Committee it is proposed to insert provisions containing the adaptations and additions required for Irish purposes.

The Motor-car Speed Limit.

Mr. GRATTAN DOYLE asked the Home Secretary if he would say when it was proposed to abolish the 20 miles per hour limit for motor cars, which nobody paid the smallest attention to.—Mr. ARTHUR NEAL (Parliamentary Secretary to the Ministry of Transport) replied: The question of speed limits is under consideration, but my right honourable friend the Minister of Transport does not propose to take any action until he is in a position to deal comprehensively with the whole question of speed limits as applied to different

types of road vehicles. It may be pointed out that the maximum speed limit of 20 miles per hour is imposed by statute and cannot be abolished without fresh legislation.

Payment of Treatment Allowances.

Sir HENRY HARRIS asked the Minister of Pensions whether he was aware that the Ministry in a recent letter informed the London War Pensions Committee that, as regards the payment of treatment allowances, the question to be considered was whether a man was prevented from following his occupation in consequence of the amount of time taken up in obtaining the treatment ordered by the Ministry, and that if he was so prevented treatment allowances were payable, but not otherwise; whether he was aware that in 1917 the Ministry's instructions to local committees under the Royal Warrant stated that treatment allowances were payable to disabled men undergoing a course of treatment if it was considered that during the period of the treatment the man was not reasonably able to work, and that such interpretation of the Royal Warrant had been in force up to the present time; and whether he would state the reasons of the Ministry for adopting this new and restricted interpretation of the Royal Warrant, which had the effect of denying treatment allowances to men who during a course of treatment were unfit for work unless the amount of time occupied in the treatment would prevent the man following his occupation, and why instructions on the subject had not been circulated to local war pensions committees generally.—Mr. MACPHERSON replied: I am not able to identify the precise letter referred to by my honourable friend, but from the terms of the letter I gather that it related to cases of men in receipt of out-patient treatment at hospitals or clinics, or of treatment in their own homes. I would draw my honourable friend's attention to the terms of Article 6 of the Warrant, which clearly provide that allowances at the maximum rate of pension are only payable where, in consequence of the course of treatment deemed necessary in the man's interests, he is unable to provide for the support of himself and family. The condition of payment of such allowances, referred to by my honourable friend in the first part of his question, is only one, though an important one, of the conditions which would entitle the man to full allowances; but clearly, also, a man may be actually prevented from working, not by the length of time occupied in treatment, but by the fact that the treatment, coupled with the condition for which treatment is being given, is such as to render it undesirable, or even impossible, in the doctor's opinion, for the man to work, and in such a case full treatment allowances would be payable. This is not a new interpretation of the Royal Warrant, but, as it was found that misapprehension had arisen as to the terms of the instructions, and considerable abuse of the provisions of Article 6 had occurred, the attention of local committees and others concerned was drawn to the matter by a circular issued in the early part of the present year.

The Deduction of Hospital Stoppages.

Captain COOTE asked the Minister of Pensions whether he could state the principles under which hospital stoppages were deducted from treatment allowances; and why it was that at the same hospital some men were stopped 9*s.* per week and others 19*s.*—Mr. MACPHERSON replied: The revised Pensions Warrant of last year, under which, as my honourable and gallant friend will remember, a substantial increase of pension was given to meet the increased cost of living, provided that a pensioner in hospital (who is not on pension, but on special rates of allowance) should in all cases personally receive, or be credited with, a cash allowance of 21*s.* each week, and further, that, if he were married, his wife should receive an increased allowance of 20*s.* a week. The apparent anomalies referred to are simply due to the fact that while the unmarried pensioner receives, or is credited with, not more than his 21*s.* a week (which is 19*s.* less than the maximum rate of pension) the aggregate amount received by the married pensioner and his wife is 41*s.* a week, or 9*s.* less than the maximum rate of pension. The explanation is, as my honourable and gallant friend will have perceived, that the allowance to the wife, who has to meet the expenses of the home and the higher cost of living while the man is in hospital, is double the rate of the allowance payable to a wife who is living at home with her husband on pension.

Cost per Patient in London Hospitals.

Sir WILLIAM DAVISON asked the Minister of Health if he would state what was the average weekly cost per patient in the London hospitals in respect of maintenance and in respect of medicine and medical attendance.—Dr. ADDISON replied: No figures are available for the present year, but according to the Statistical Report of the King Edward's Fund the average cost per occupied bed in 1919 worked out at £168 13*s.* 6*d.*, or approximately £3 5*s.* per week for the hospitals having medical schools (with the exception of St. Bartholomew's), and at £140 10*s.* 3*d.*, or approximately £2 14*s.* per week, for the larger general hospitals without medical schools.

Registration of Chemists and Druggists.

Mr. CROOKS asked the Minister of Health whether he was aware that the by-law made by the Council of the Pharmaceutical Society, and approved by the Privy Council in February, 1920, in pursuance of Section 4 (b) of The Poisons and Pharmacy Act, 1908, deprived all persons holding the assistant's certificate of the Society of Apothecaries who had served with His Majesty's forces during the late war from being registered as chemists and druggists and restricted registration to persons who had been continuously employed in a strictly limited number of institutions and so deprived many fully qualified persons from registration, contrary to the express intentions of the 1908 Act; and whether he would request the Council of the Pharmaceutical Society to amend their by-law so as to provide for the registration as chemists and druggists of all assistants of the Society of Apothecaries who held certificates at the time of the passing of The Poisons and Pharmacy Act, 1908, provided that they had been engaged in dispensing for a reasonable period, not necessarily continuous, since 1908, so as to admit of the registration of ex-Service men.—Mr. BALFOUR (Lord President of the Council) replied: The by-law in question aims at meeting an old complaint of the certified assistants to apothecaries against the Pharmaceutical Society, and was accepted as a fair compromise by the Society and the Association of Certified Assistants. There is no power to induce the society to go further on the road of concession.

MONDAY, NOV. 15TH.

MINISTRY OF HEALTH BILL.

The House went into Committee on the Ministry of Health (Miscellaneous Provisions) Bill, Mr. WHITLEY, Chairman of Committees, presiding, and on the financial resolution authorising the payment out of moneys provided by Parliament of grants under Section 1 of the Housing (Additional Powers) Act, 1919, in respect of houses completed within two years of the passing of that Act, or such other period not exceeding four months as the Minister of Health might in any special case allow.

Sir D. MACLEAN pointed out that over £100,000,000 more was being spent by the local authorities this year than the total Imperial expenditure of the country in 1914. He suggested that the time had now arrived when the House should exercise the same check over increased charges on the citizen as a ratepayer as over the proposals to raise taxes. Before giving the Government authority to lay any fresh charges upon the local authorities the House ought to know to what it was committing the country.

Mr. BONAR LAW (Leader of the House) agreed that something of the kind suggested by Sir D. Maclean was necessary. If they could exercise some control over expenditure on the rates they ought to do so, but it would be a great mistake to give the ratepayers the impression that they could get any real protection from the House of Commons. The protection must come from themselves. The Government, however, would be willing to set up a Select Committee to consider in what way they could effectually exercise some control on the expenditure from the rates in connexion with Bills introduced into that House. Quite apart from any criticism of the Bill, there was no doubt that it was an unusual and he thought himself an undesirable course to introduce so complicated a Bill in an autumn session. He hoped that such a practice would not become permanent. It was not the fault of the Minister of Health that the Government had been compelled to adopt the present mode of procedure. The Bill was accepted by the Cabinet last July, and the delay was due to the pressure of other business. But while the Bill was a very complicated one, many of its provisions were absolutely necessary. The Minister of Health realised everything that he (Mr. Bonar Law) had said, and also realised what the sense of the House was in regard to the matter. They might be told that the Government had climbed down. They had never climbed down, and they did not intend to do so now. There were certain clauses of the Bill which Dr. Addison had agreed that he would not ask the Committee to proceed with. The Government would like the Bill to go to Committee as it now stood, and they would not attempt to use the authority of the Government to upset the decisions of the Committee, unless they cut out something that the Government considered absolutely vital. There were some provisions in the Bill which they did consider vital.

In the subsequent discussion several Members urged the Government to withdraw the Bill temporarily at least, and others pressed strongly for information as to which were the clauses the Minister was prepared to drop.

Viscountess ASTOR hoped that the Government would go on with the Bill and would not drop any essential clauses. There were certain things in which the nation could not afford to economise, and one of these was health. If the financial clauses were dropped the hospitals would for a long time be in an even worse state than they were now. If the

provision for shell-shock cases were dropped heroes of the war would fail to get treatment in time to prevent their going to a lunatic asylum.

Dr. ADDISON (Minister of Health), in response to appeals to him to mention at that stage the clauses which he did not propose to press, said he had no objection to doing so. Clauses 7 (rate of interest on certain advances and expenses), 8 (powers as regards water-supply), 15 (powers to increase inspectors of nuisances), 16 (amending the law regarding post-mortem examinations), and 19 (power of trustees to invest in county council mortgages) were all novel clauses, but none was vital just now. Other clauses which he could not describe under this heading, and which the Government did not wish to proceed with, were 9 (penalties in regard to urban authority contracts), 12 (regulation of sale of clinical thermometers), 13 (amendment of law relating to the sale of food and drugs), 17 (expenses in connexion with associations of local authorities, and in connexion with meetings, conferences, &c.), 20 (sanction of contributions by officers of a local authority to authority's loans), 22 (continuance in force of certain provisions of the Local Government Emergency Provisions Act, 1916), and 25 (alteration of boundaries of wards and number of councillors in a borough).

A division was challenged but not persisted in, and the motion was agreed to.

Loss of Memory Cases.

Mr. SWAN asked the Minister of Health if steps would be taken to remove from lunatic asylums and Poor-law institutions all discharged soldiers and sailors suffering from temporary loss of memory attributable to the war and place them in homes suitable for their case and compatible with the service they have rendered to the State.—Dr. ADDISON replied: I am advised that no discharged soldiers or sailors are known to be in asylums who are there because they suffer merely from temporary loss of memory attributable to the war. There are, of course, many ex-Service men suffering from various forms of certifiable insanity in which loss or impairment of memory may form one of the symptoms. Such men are kept as private patients under satisfactory conditions. To remove them to separate homes or institutions would be neither economical nor in the interests of the patients themselves.

Cost of the Tuberculosis Bill.

Colonel NEWMAN asked the Minister of Health whether he could give an approximate estimate of the total yearly addition to the rates in the event of the Public Health (Tuberculosis) Bill becoming law in its present shape.—Dr. ADDISON replied: A White Paper will be circulated explaining fully the provisions of the Bill and giving an estimate of the additional charge on rates and taxes consequent on the Bill.

Condensed Milk Standard.

Mr. GRATTAN DOYLE asked the Minister of Health whether, in view of the fact that the delay in issuing regulations to give effect to the recommendations of the committee set up to inquire into the determination of a standard for condensed milks facilitates the importation of condensed milk with low standards of cream, to the detriment of consumers who mainly consisted of the labouring classes and included a large number of infants, and in view of the fact also that this delay caused damage to the British industry for producing the article in this country and had resulted in a considerable reduction in production here, urgent consideration would be given to the question.—Dr. ADDISON replied: The preparation of regulations of this nature is a matter which necessarily takes time, but they are now in an advanced state, and I can assure the honourable Member that it is being proceeded with without any avoidable delay.

Salaries of University Staffs.

Sir WILLIAM DAVISON asked the President of the Board of Education whether a deputation from British universities which waited on the Chancellor of the Exchequer and himself towards the end of last session were informed by the spokesman of the Government that universities throughout the country were expanding beyond their means, and that they had been more anxious to extend their buildings than to pay adequately their existing staffs, whose salaries were much too low; and whether, under these circumstances, he would refrain from exerting further pressure on behalf of the Government on the University of London to issue an appeal for funds for the erection of new university buildings until such time as provision had been made for the payment of adequate salaries to its teachers.—Mr. HERBERT LEWIS (Parliamentary Secretary to the Board of Education) replied: The deputation was warned by the Chancellor of the Exchequer against the danger of attempting extensions into new fields of work unwarranted by their financial position. The question of new buildings for the University of London is, however, one of providing adequate accommodation for the existing activities of the University, and the Government do not consider that delay in a matter so seriously affecting the efficient organisation of its work would be in the best interests of the University. I have no evidence that the University is neglecting the important question of the adequate remuneration of the teachers in its employment.

TUESDAY, NOV. 16TH.

Expenditure in Mesopotamia.

Major BARNES asked the Secretary for War whether the estimates given of the monthly expenditure on military purposes in Mesopotamia—namely, £2,500,000—was an inclusive figure covering the proportion of the cost of the 100 Rolls-Royce chassis ordered for that country, engineering works carried out for the purpose of military operations whether by soldiers or civilians, medical service, and all expenditure directly or indirectly connected with the military operations and garrisoning of the country; and, if not, what was the said inclusive figure.—Mr. CHURCHILL replied: The 2½ millions a month includes the cost of the Rolls-Royce chassis referred to, but not capital expenditure on works and land. The latest estimate of expenditure on the last two items during the current financial year is approximately £1,000,000.

A Tuberculosis Pension Claim.

Mr. CAIRNS asked the Minister of Pensions if he was aware that two certificates were put in for Sapper William Heppel, No. 285,435, Royal Engineers, one from Dr. Newsted, M.D., Blyth, pointing out that Sapper Heppel was free from tuberculosis before he joined up, and one from Dr. Eaton, M.B., C.M., that tuberculosis had developed during military service; and would he pay the widow and child of this soldier a pension under such circumstances.—Major TRYON replied: The medical evidence to which my honourable friend refers was very carefully considered in connexion with the widow's claim to pension; but the medical advisers of the Ministry were of opinion that the disease from which this soldier died commenced after discharge and was not due to service. Mrs. Heppel had been informed that, should she desire to appeal against the consequent refusal of pension, her local committee will assist her in preparing her case for the tribunal.

Cases for Concurrent Treatment and Training.

Mr. ARTHUR MICHAEL SAMUEL asked the Minister of Pensions whether he was able to say how many ex-Service men were still awaiting admittance to the institutions approved for concurrent treatment and training; what arrangements had been made for supplying the full accommodation needed; by what date that accommodation would be provided; and what was the amount of public money that had been expended in treatment allowances during the current year to men and their families who, though approved as requiring this form of treatment and training, were, in fact, not receiving it owing to lack of accommodation.—Major TRYON replied: At the end of last month some 2000 men had been recommended by medical referees for admission to convalescent centres for concurrent treatment and training. Arrangements are now in progress for providing substantial additions to the existing accommodation, and a first instalment of 300 places will be available in the course of a few weeks. I regret the figures asked for in the last part of the question are not available, but I would point out that not all men who have been recommended for concurrent treatment and training are in receipt of allowances.

Appointments.

CHISHOLM, J. B., M.B., Ch.B. Edin., has been appointed Honorary Assistant Medical Officer to the Jessop Hospital for Women, Sheffield.

MACKINTOSH, Colonel D. J., C.B., M.V.O., M.B., C.M. Glasg., Member of Consultative Council of the Scottish Board of Health on Medical and Allied Services.

PINEY, A., L.R.C.P. Lond., M.R.C.S., Demonstrator in Pathology, University of Birmingham, and Assistant Pathologist, General Hospital, Birmingham.

WILKES, E. A. F., M.R.C.S., L.R.C.P. Lond., D.P.H., Medical Officer of Health for Barnes.

Great Northern Central Hospital: THOMPSON, T. M., M.B., Ch.B., and FRY, L. S., M.R.C.S., L.R.C.P. Lond., D.P.H., House Physicians.

Queen's University of Belfast: JOHNSTONE, R. J., M.B., F.R.C.S. Eng., Professor of Gynæcology; LOWRY, C. G., M.D., F.R.C.S. Irel., Professor of Midwifery and Diseases of Infants.

Certifying Surgeons under the Factory and Workshop Acts: OWEN, J. W., L.R.C.P. Edin., L.R.F.P.S.G. (Penmachno), EAMES, ALETHEA J. (Glyn Ceiriog).

Vacancies.

For further information refer to the advertisement columns.

Barrow-in-Furness, North Lonsdale Hospital.—Second Res. H.S. £225.

Bath, Royal United Hospital.—Two Hon. Asst. P.'s and Path.

Bedford County Hospital.—H.S. and Asst. H.S. £180 and £150.

Birmingham General Hospital.—Res. Anæsth., H.P., and H.S. £100. Also two H.S.'s. £125.

Bradford Royal Eye and Ear Hospital.—Aural S.

Breconshire County Council.—Asst. M.O.H. £500.
City of London Hospital for Diseases of the Chest, Victoria Park, E.—Asst. M.O. £150.
Colonial Service.—M.O.'s for West African Medical Staff, Government Service in Malaya, East African Protectorates, West Indies (including British Guiana), Fiji, and the Western Pacific, &c.
Devon County Council.—Asst. Sch. M.O. £500–£600.
Doncaster Royal Infirmary and Dispensary.—Asst. H.S. £225.
Dumfries, Crichton Royal Mental Hospital.—Jun. Asst. P. £350.
East London Hospital for Children and Dispensary for Women, Shadwell, E.—Two Asst. P.'s.
Edinburgh Education Authority.—Asst. M.O. £500.
Elizabeth Garrett Anderson Hospital, Euston-road.—Female H.P., Obstet. Asst., and two H.S.'s. £50 each. Anæsth. £10 10s. Dent. S.
Evelina Hospital for Children, Southwark, S.E.—H.S. £160.
Federated Malay States Colonial Service.—Pathologist to Medical Research Institute. £1050.
Gloucestershire Royal Infirmary and Eye Institution.—Asst. H.S. £150.
Guildford, Royal Surrey County Hospital.—Third H.S. £150.
Hospital for Women, Soho square, W.—Clin. Assts.
Huddersfield Royal Infirmary.—Sen. H.S. £250.
Hull Royal Infirmary.—Asst. H.S. £150.
Inverness, Northern Infirmary.—H.S. £150.
Jodhpore, Rajputana, India, Jaswant Female Hospital.—Medical Woman. Rs. 450 per mensem.
King's College Hospital, Denmark Hill, S.E.—Sambrooke Med. Registrar, Also Med. and Surg. Out-patient O.'s £250.
Leamington Spa, Warneford, Leamington, and South Warwickshire General Hospital. Res. H.P. or H.S. £200.
Lewes Victoria Hospital and Dispensary.—Res. M.O.
Liverpool, David Lewis Northern Hospital.—H.S. £120.
London County Mental Hospital Service.—Sixth and Seventh Asst. M.O.'s. £300.
London Jewish Hospital, Stepney Green, E.—Asst. P.
London Lock Hospital, 91, Dean-street, W.—Hon. S.
London Temperance Hospital, Hampstead-road, N.W.—Res. M.O. £200.
Macclesfield General Infirmary.—Res. H.S. £200.
Manchester, Ancoats Hospital, Mill-street.—H.S. £150.
Manchester Northern Hospital for Women and Children, Park-place, Cheetham Hill-road.—Pathologist.
Manchester Royal Infirmary.—Three Asst. M.O.'s. £35.
Margate, Royal Sea Bathing Hospital for Tuberculosis.—Non-resident S. £300.
Milroy Lectures on State Medicine and Public Health.—Milroy Lecturer.
Ministry of Health.—Female M.O. £600.
Monmouthshire Education Committee.—Asst. M.O. £500.
Mount Vernon Hospital for Tuberculosis and Diseases of the Lungs and Heart, Northwood, Middlesex.—Asst. P.
Newcastle-upon-Tyne and Northumberland Sanatorium for Consumptives, Barrasford, North Tyne.—Med. Supt. £650.
Northallerton, North Riding of Yorkshire County Council Education Committee.—Asst. Sch. M.O. £500.
Northleach Union.—M.O. £40.
Norwich, Norfolk and Norwich Hospital.—H.P. and Fourth H.S. £200 each.
Nottingham General Hospital.—Res. Cas. O. £300. Also H.S. £200.
Poplar Hospital for Accidents, Poplar, E.—Asst. Res. S. £150.
Pontypridd Urban District Council.—Female Asst. M.O. £550.
Radnorshire County Council.—County M.O. and Sch. M.O. £700.
Reading, Royal Berkshire Hospital.—Second H.S. £200.
Rhondda Urban District Council.—Asst. Sch. M.O. and M.O.H. £600. Also Dent. S. £500.
Rochester, St. Bartholomew's Hospital.—Jun. Res M.O. £200.
Romford Isolation Hospital.—M.O.H. and Med. Supt. £750.
Rotherham Hospital.—Jun. H.S. £150.
Royal Eye Hospital, St. George's Circus, Southwark.—Hon. Rad. and Hon. Rhinologist.
Royal Free Hospital, Gray's Inn-road, W.C.—Cas. O. £100. Also Res. Obst. Asst. £150.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Cas. O. £100.
St. Helens Hospital, Lancashire.—H.S. £250.
St. Mary's Maternity Hostel, Croydon.—Member of Visiting Med. Staff and Hon. Med. Registrar.
St. Peter's Hospital, Henrietta-street, Covent Garden, W.C.—Anæsth. £25. Also Jun. H.S. £75.
Salford Royal Hospital.—Cas. H.S. £150.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—Anæsth.
South Shields, Ingham Infirmary and South Shields and Westoe Dispensary.—Sen. and Jun. H.S. £225 and £175.
Springfield Mental Hospital, Wandsworth Common, S.W.—Asst. M.O. £425.
Stoke-on-Trent County Borough.—Asst. Tuberc. O. £400.
Surrey, County of.—County M.O.H. £1200.
Swansea County Borough.—Asst. M.O. £500.
Throat Hospital, Golden-square, W.—Hon. Med. Registrar.
Weston-super-Mare Hospital.—H.S. £156.

The Chief Inspector of Factories, Home Office, S.W., gives notice of a vacancy for a Certifying Surgeon under the Factory and Workshop Acts at North Tawton.

Births, Marriages, and Deaths.

BIRTHS.

ATKINSON FAIRBANK.—On Nov. 9th, at Digby Mansions, W., the wife of J. G. Atkinson Fairbank, O.B.E., M.B., of a daughter.

BUSHE.—On Nov. 11th, at Ellerton-road, Wandsworth Common, the wife of Surgeon-Commander C. K. Bushe, O.B.E., M.D., Royal Navy, of a daughter.

PICKUP.—On Nov. 8th, at Albert-road, Regent's Park, N.W., the wife of Dr. A. McLean Pickup, of a daughter.

MARRIAGES.

CHILD—HOLLAND.—On Nov. 9th, at the Cathedral, Manchester, Cyril Holland Child, M.B.E., D.D.S., L.D.S., to Hilda, youngest daughter of the late Hugh Holland and of Mrs. Holland, of Knutsford and Bolton.

FARAKER—NIHILL.—On Nov. 6th, at St. Mary-in-the-Castle Church, Hastings, Erskine C. Faraker, M.R.C.S., L.R.C.P., to Mercy Barclay Nihill, youngest daughter of the late Rev. H. Barclay Nihill and Mrs. Nihill, of Sedlescombe-road South, St. Leonards-on-Sea.

LENNOX—THOMSON.—On Nov. 10th, at Christ Church, Lancaster Gate, London, David Lennox, M.B., to Madge Pauline Ogilvie, only daughter of Mr. and Mrs. A. J. Thomson, Egerton-road, Kimberley, South Africa.

DEATHS.

HIME.—On Nov. 9th, Thomas Whiteside Hime, M.D., aged 78.

HOLLAND.—On Nov. 15th, 1920, Henry Frederick Holland, M.D., J.P., of Charterhouse-road, Godalming, late of Ampthill, Beds, and Burlington-street, Manchester, aged 91. Funeral Friday. Cremation, Woking, 11 o'clock. Godalming Church, 3 o'clock.

MOIR.—On Nov. 11th, at Southfield, Stirling, Robert Moir, M.D., in his 87th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Communications, Letters, &c., to the Editor have been received from—

A.—Actors' Orphanage, Lond.; Dr. A. Adams, Frodsham; Mr. R. J. Albery, Lond.; Admiralty, Lond.; Anglo-American University Library for Central Europe, Lond., Hon. Sec. of; Mr. H. Atkins, Brighton.

B.—Dr. G. Blacker, Lond.; Sir J. Barr, Liverpool; Messrs. P. Blakiston's Son and Co., Philadelphia; Mr. H. W. Bayly, Lond.; Sir H. E. Bruce-Porter, Lond.; Dr. W. T. Brown, Leytonstone; Mr. A. Barnes, Lond.; Dr. J. Brownlee, Lond.; British Dental Association, Lond., Sec. of; Dr. H. Brown, Lond.; Dr. U. N. Brahmachari, Calcutta; Dr. E. F. Buzzard, Lond.; Dr. J. M. Bruce, Lond.

C.—Dr. A. J. Chalmers, Khartoum; Prof. A. R. Cushny, Edinburgh; Chadwick Trust, Lond.; Messrs. J. and A. Churchill, Lond.; Dr. A. K. Chalmers, Glasgow; Messrs. Christopherson, Lond.; Prof. E. L. Collis, Cardiff; Col. S. L. Cummins, Lond.; Dr. T. C. Clare, Leicester; Dr. J. H. L. Cumpston, Melbourne; Dr. W. Cramer, Lond.; Dr. M. C. Cawston, Los Angeles; Dr. F. G. Clemow, Constantinople; Messrs. E. Cook and Co., Lond.; Dr. F. G. Cawston, Durham; Surg.-Lt.-Commdr. A. B. Clark, R.N.; Children's Jewel Fund, Lond.

D.—Dr. I. Davies, Cardiff; Dr. G. Dinolt, Vienna; Dr. I. J. Davies, Lond.; Dr. J. A. Davidson, Lond.; Mr. E. J. Domville, Bridport; Messrs. Duncan, Flockhart, and Co., Lond.; Dr. D. Dougal, Manchester.

E.—Express Dairy Co., Lond.; Dr. I. Eban, Reading.

F.—Dr. W. M. Fergusson, Banff; Federation of Medical and Allied Societies, Lond.; Dr. A. M. Fraser, Portsmouth.

G.—General Medical Council, Lond.; Dr. W. Griffith, Lond.; Surg.-Commdr. D. H. C. Given, R.N.; Messrs. R. W. Greeff and Co., Lond.; Great Northern Central Hospital, Lond.

H.—Dr. W. E. Home, Southsea; Prof. R. Howden, Newcastle-on-Tyne; Dr. C. Horsford, Lond.; Miss E. E. Hewer, Lond.; Dr. J. R. Harper, Barnstaple; Dr. R. E. V. Hale, Lond.

I.—Dr. E. C. B. Ibotson, Corris.

J.—Prof. R. Jorge, Lisbon.

K.—Dr. R. H. Kennan, Liverpool; Dr. B. Kin, Taunton; Dr. W. E. de Korté, Cape Town.

L.—Dr. S. C. Lawrence, Lond.; Dr. F. Langmead, Lond.; Liverpool Medical Institution.

M.—Ministry of Health, Lond.; Dr. H. Munro, Topsham; Rev. J. Marchant, Lond.; Ministry of Pensions, Lond.; Dr. J. C. McClure, Lond.; Medico-Legal Society, Lond.; Ministry of Agriculture and Fisheries, Lond.; Messrs. McBride, Nash, and Co., Lond.; Metropolitan Life Insurance Co., New York; Capt. J. F. McMillan, Sandown.

N.—National Safety Council, Chicago; Dr. J. A. Nixon, Clifton; Navy, Medical Department of the, Lond.; National Anæsthesia Research Society, Columbus, Ohio, Executive Sec. of; National Association for Supplying Female Medical Aid to the Women of India, Simla.

O.—Dr. T. H. Oliver, Manchester; Dr. H. J. Orr-Ewing, Jerusalem.

P.—Dr. J. A. P. Pereira, Sheffield; Plymouth Education Authority; Mr. R. Pluchon, Paris; Mr. V. G. Plarr, Lond.; Mr. G. Pringle, Chelmsford; Dr. V. Pauchet, Paris; Dr. H. W. Pooler, Alfreton.

Q.—Mr. R. W. A. Quinton, Lond.

R.—Lt.-Col. A. W. Robertson, Lond.; Sir L. Rogers, Cambridge; Mr. H. M. Rainsford, Lond.; Dr. C. Russ, Lond.; Royal Society of Medicine, Lond.; Dr. J. A. Ryle, Lond.; Research Defence Society, Lond.; Royal Institute of Public Health, Lond.; Royal Statistical Society, Lond.; Dr. W. J. Rutherford, Jesmond; Royal Society of Tropical Medicine and Hygiene, Lond.; Royal Society, Lond.

S.—Sir P. Sassoon, Lond.; Dr. J. S. B. Stopford, Manchester; Dr. J. H. Sequeira, Lond.; Solomia, Ltd., Isleworth, Sec.; Dr. W. H. B. Stoddart, Lond.

T.—Mrs. E. M. Tindal-Robertson, Lond.; Dr. H. M. Turnbull, Lond.; Dr. J. Taylor, Lond.

U.—University of Glasgow; Universities Bureau of the British Empire, Lond.

V.—Dr. A. L. Vischer, Basel.

W.—Wellhouse Hospital, Barnet; West London Medico-Chirurgical Society, Hon. Sec. of; West London Hospital Post-Graduate College; Dr. E. W. A. Walker, Oxford; Dr. C. M. Wilson, Lond.; Rt. Hon. Lord Weardale, Lond.; War Office Publicity Department, Lond.; Dr. C. H. Whiteford, Plymouth; Dr. S. I. Welsh, Lond.; Dr. A. J. Whiting, Lond.

Communications relating to the editorial business should be addressed exclusively to the Editor of THE LANCET, 423, Strand, London, W.C. 2.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY, Burlington House, London, W.
THURSDAY, Nov. 25th.—Papers: Prof. L. Hill: The Growth of Seedlings in Wind.—Prof. P. T. Herring: The Effect of Thyroid-feeding and of Thyro-parathyroidectomy upon the Pituitrin Content of the Posterior Lobe of the Pituitary, the Cerebro-spinal Fluid and Blood (communicated by Sir E. Sharpey Schafer).—Mr. W. A. Jolly: Reflex Times in the South African Clawed Frog (communicated by Sir E. Sharpey Schafer).—Prof. J. A. Gunn and Mr. R. St. A. Heathcote: Cellular Immunity. Observations on Natural and Acquired Immunity to Cobra Venom (communicated by Prof. C. S. Sherrington).—Mr. L. T. Hogben: Studies on Synapsis. III., The Nuclear Organisation of the Germ Cells in Libellula Depressa (communicated by Prof. E. W. MacBride).

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Monday, Nov. 22nd.

SECTION OF ODONTOLOGY: at 8 P.M.
Casual Communications:
Mr. Montagu F. Hopson: (1) Complete Absence of Deciduous and Permanent Teeth: (2) Twenty Unerupted Teeth in Mouth of Patient aged 49 Years.
Mr. A. T. Pitts: (1) Radicular Odontome in a Child of 7½ Years; (2) Hypoplasia of Deciduous Dentition; (3) Absence of the Premolars with Absorption of the Deciduous Molars.
Mr. Lewin Payne: A Modification of Kingsley's Velum for Cleft Palate.

Tuesday, Nov. 23rd.

SECTION OF MEDICINE: at 5.30 P.M.
Cases:
The President (Dr. A. F. Voelcker) will show a Case of Early Banti's Disease with Splenectomy.
Other cases will be shown and will be followed by an Informal Discussion.

Thursday, Nov. 25th.

SECTION OF UROLOGY.
3.30 to 5.30 P.M., at Guy's Hospital, S.E.:
Mr. A. R. Thompson will Demonstrate Operations and Cases.
8.30 P.M., Clinical and Pathological Meeting at 1, Wimpole-street, W.
Specimens will be shown by Mr. Zachary Cope, Mr. Thomson Walker, and others.
N.B.—Will any Member wishing to show cases or specimens communicate with the Hon. Secretary before Nov. 23rd

Friday, Nov. 26th.

SECTION OF STUDY OF DISEASE IN CHILDREN: at 5 P.M. (Cases at 4.30 P.M.)
Cases:
Dr. E. A. Cockayne: A Case for Diagnosis.
Dr. George Graham: Diabetes Mellitus of an Unusual Type (two cases).
Dr. F. Langmead: (1) Osteogenesis Imperfecta; (2) Recurrent Facial Paralysis.
Dr. Flora Murray: A Case of Osteomalacia.
Dr. Jewesbury: (1) Deformity of Skull with Other Bony and Eye Changes: (2) Œsophageal Obstruction, aged 4 Years; (3) Lesion of Crus Cerebri in a Child.
Other cases will be shown.
Short Communication:
Dr. Dru Drury (Grahamstown, S. Afrcia): Malformation of the Face, Ear, Eye, and Hand occurring in an Infant.

SECTION OF EPIDEMIOLOGY AND STATE MEDICINE: at 8.30 P.M.
Paper:
Dr. Arnold Chaplin: Measures for Preserving the Health of Seamen on Board Ship.

PHYSIOLOGICAL SOCIETY, St. Bartholomew's Hospital, E.C.
SATURDAY, Nov. 20th.—4 P.M., Meeting.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY, Nov. 22nd.—8.30 P.M., Dr. F. J. Poynton, Dr. D. H. Paterson, and Dr. J. C. Spence: A Study of an Outbreak of Acute Rheumatism in Children under 12 Years.—Dr. G. E. S. Ward: Some Disorders of the Myocardium.

ROYAL ANTHROPOLOGICAL INSTITUTE, Royal Society, Burlington House, W.
TUESDAY, Nov. 23rd.—8.30 P.M., Huxley Memorial Lecture:—Dr. A. C. Haddon: Migrations of Cultures in British New Guinea.

HUNTERIAN SOCIETY, at Guy's Hospital, S.E.
WEDNESDAY, Nov. 24th.—4 P.M., Clinical Meeting. Demonstrations will be given by Mr. Joffe, Dr. Ryle, Mr. K. Fry, Mr. Todd, and Dr. Hunt. Clinical Cases will be shown by Dr. Symonds, Dr. Mutch, Dr. Barber, Mr. Hughes, Mr. Slesinger, Mr. Bromley, Mr. Cook, Mr. Tanner, Mr. K. Fry, and others.

ROYAL SOCIETY OF ARTS, John-street, Adelphi, W.C.
WEDNESDAY, Nov. 24th.—8 P.M., Dr. F. W. Edridge-Green: Colour Vision and Colour Blindness.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, Nov. 22nd.—12.15 P.M., Dr. Burnford: Pathological Demonstration. 5 P.M., Lecture:—Dr. G. Stewart: Forms of Meningitis: Tuberculous Meningitis—Pathology, Symptoms, Diagnosis, Treatment.
TUESDAY.—12 noon, Mr. T. Gray: Demonstration of Fractures. 5 P.M., Lecture:—Mr. Banks Davis: Various Forms of Tonsillitis connective with Rheumatism—Recurrent Tonsillitis, Quinsy.
WEDNESDAY.—2 P.M., Dr. Morton: X Ray Department. 5 P.M., Lecture:—Mr. D. Armour: Arthritis. (Lecture I.)
THURSDAY.—2 P.M., Mr. MacDonald: Surgical Out-patients. 5 P.M., Lecture:—Dr. T. M. Legge: Anthrax (open to all medical practitioners).
FRIDAY.—2 P.M., Dr. Pernet: Skin Department. 5 P.M., Lecture:—Mr. Steadman: Dental Sepsis in its Relation to Rheumatism.
SATURDAY.—10 A.M., Dr. Arthur Saunders: Medical Diseases of Children. 12 noon, Mr. Sinclair: Surgical Diseases of the Abdomen.
Daily:—10 A.M., Ward Visits. 2 P.M., In-patient, Out-patient Clinics and Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, Nov. 22nd.—2 P.M., Dr. A. J. Whiting: Medical In-patients. 2.30 P.M., Mr. J. B. Banister: Gynæcological Out-patients. 3 P.M., Mr. W. F. Tanner: Selected Surgical Cases. 6 P.M., Dr. F. L. Provis and Mr. T. H. C. Benians: Venereal Department.
TUESDAY.—9.45 A.M., Lieut.-Col. R. H. Elliot and Mr. N. Fleming: Eye Cases and Operations. 2.30 P.M., Mr. C. H. Hayton: Throat, Nose, and Ear. 4.30 P.M., Dr. J. B. Alexander: Selected Medical Cases.
WEDNESDAY.—2 P.M., Mr. C. H. Hayton: Throat Operations. 3 P.M., Dr. W. J. Oliver: Selected Skin Cases. 5 P.M., Dr. F. L. Provis and Mr. T. H. C. Benians: Venereal Department.
THURSDAY.—2 P.M., Mr. N. Fleming: Eye Out-patients. 3 P.M., Mr. H. W. Carson: Selected Surgical Cases.
FRIDAY.—2.30 P.M., Dr. C. E. Sundell: Children Out-patients. 3 P.M., Mr. W. E. Tanner: Selected Surgical Cases. 5 P.M., Dr. F. L. Provis and Mr. T. H. C. Benians: Venereal Department.
SATURDAY.—3 P.M., Mr. H. W. Carson: Surgical In-patients.
Daily:—2 P.M., Operations, In-patient, Out-patient Clinics.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, W.C. 1.
MEDICAL SCHOOL.
MONDAY, Nov. 22nd.—2–3.30 P.M., Out-patient Clinic: Dr. Collier. 3.30 P.M., Pathological Demonstration: Dr. Greenfield.
TUESDAY, Nov. 23rd.—2–3.30 P.M., Out-patient Clinic: Dr. Grainger Stewart. 3.30 P.M., Lecture:—Dr. Greenfield: Cerebro-spinal Fluid.
WEDNESDAY, Nov. 24th.—2 P.M., Demonstration of Fraenkel's Exercises.
THURSDAY, Nov. 25th.—2–3.30 P.M., Out-patient Clinic: Dr. Farquhar Buzzard. 3.30 P.M., Lecture:—Dr. Gordon Holmes: Cerebro-spinal Syphilis.
FRIDAY, Nov. 26th.—2–3.30 P.M., Out-patient Clinic: Dr. Gordon Holmes. 3.30 P.M., Lecture:—Mr. Sargent: Surgery of the Nervous System.
SATURDAY, Nov. 27th.—9 A.M., Surgical Operations.
Fee for Post-Graduate Course £7 7s. C. M. HINDS HOWELL, Dean.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Nov. 25th.—4 P.M., Lecture:—Mr. T. Gray: Congenital Hypertrophic Stenosis of Pylorus.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.
MONDAY, Nov. 22nd.—5.30 P.M., Post-Graduate Lecture:—Dr. Hamill: Auricular Fibrillation.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, 49, Leicester-square, W.C.
THURSDAY, Nov. 25th.—6 P.M., Chesterfield Lecture:—Dr. J. L. Bunch: Pruritus and Itching Diseases of the Skin.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE CLINIC.
TUESDAY, Nov. 23rd.—4.30 P.M., Lecture:—Dr. A. E. Barclay: X Ray Interpretation and the Cases in which X Rays are likely to be of Assistance in Diagnosis and Treatment (continued).

MANCHESTER FRENCH HOSPITAL POST-GRADUATE LECTURES, 24, Acomb-street (behind Whitworth Park).
THURSDAY, Nov. 25th.—4.15 P.M., Dr. A. C. Magian: Surgical Treatment of Some Common Gynæcological Complaints. (Lecture III.)

SALFORD ROYAL HOSPITAL AND ANCOATS HOSPITAL POST-GRADUATE DEMONSTRATIONS, at the two Hospitals alternately.
THURSDAY, Nov. 25th.—4.30 P.M., Mr. Ollerenshaw: Demonstration of Orthopædic Cases. (At Salford Royal Hospital.)

THE LATE DR. H. F. HOLLAND: A LINK WITH THE PAST.—On Nov. 15th, at the advanced age of 92, Dr. Henry Frederick Holland, who had been a medical attendant to the Duke of Wellington, and had earned for himself the title of Grand Old Man of Godalming, died in Charing Cross Hospital, where some 70 years earlier he had been a medical student and silver medallist in surgery. Qualifying in 1855 with the M.R.C.S. Eng., he graduated M.D. at St. Andrews a year later. He was active in the Volunteer movement, and served first in the 3rd Beds Regiment, and afterwards in the Home Counties Brigade, from which he retired, after 40 years' work, with the rank of Surgeon Lieutenant-Colonel. Dr. Holland was a justice of the peace for the county of Bedford, and a member of the Godalming Town Council. Two years ago, on the occasion of the Peace Celebrations, he is stated to have taken part in a flat-race organised by the corporation for its members.

Notes, Short Comments, and Answers to Correspondents.

VITAL STATISTICS IN JAMAICA, 1919.

DURING the year 1918 the population of Jamaica had decreased in numbers, partly owing to an excess of emigration over immigration, but chiefly on account of a severe visitation of influenza and pneumonia, which caused 5877 deaths, or 22·2 per cent. of the total mortality. During 1919 the excess of emigration continued, so that in spite of an increase in the military strength of 6860, there has been a net loss since 1911 of 23,971, giving a mean estimated population on June 30th, 1919, of 891,052. The birth-rate was 33·5 per 1000, slightly less than in 1917 and 1918, in each of which years it was 34·1. The enormous proportion of illegitimate births in Jamaica not only continues, but increases. In 1908-09 of every 100 births registered 60·59 were illegitimate; in 1918 the percentage was 68·6; in 1919 it was 70·07 (the actual number being 20,964), this being the eleventh year in succession that an increase in the ratio has been reported. The lowest ratio was in St. Ann's parish (61·36), the highest in St. James (77·41). The death-rate, 22·2 per 1000, shows a reversion to the island's normal condition after the influenza visitation in 1918, when the ratio was 33·0; in 1917 it had been 26·9, and in 1915, 22·5. The ratios in different parishes varied from 17·1 in Manchester and 17·7 in St. Elizabeth to 26·0 in Kingston and 32·6 in St. Andrew. Obviously such wide variation cannot be due to climate. The infantile death-rate, 16·1 (under 12 months) per 100 births, was less than in either of the four years preceding (17·5 to 18·4). It is to be regretted that, of the total deaths registered (19,857) throughout the colony, in 73·6 per cent. the cause was not certified by a medical practitioner, and that the proportion of deaths so registered shows no sign of diminution during recent years. Mr. David Balfour, the Registrar-General, states that even in Kingston, where lack of medical facilities can hardly be given as an excuse, the rate has an upward tendency. There was, however, one prosecution under the Registration Law for failure to register a death, and this was followed by conviction.

BLIND MASSEURS.

To the Editor of THE LANCET.

SIR,—In an extract from the "Notes, Short Comments, and Answers to Correspondents" in the issue of THE LANCET for Nov. 13th I was very glad to read the remarks with reference to blind masseurs, in whom I am much interested. I had considerable experience of the work of these men when in command of the Third London General Hospital during the war, and very cordially endorse those remarks. The whole question of massage is a very serious one for the medical profession, as we are held responsible for the results of the treatment we recommend, and when there are so many trained and certificated masseurs and masseuses in the country as there are to-day it is our duty towards our patients to make sure that, when we prescribe massage, it is carried out by trained workers, who have obtained the certificates of recognised training societies, such as the Incorporated Society of Trained Masseurs (since reconstructed as the Chartered Society of Massage and Medical Gymnastics), and not by people who have had no training, or who are merely acquiring practice without having undergone a thorough training.

May I accentuate the fact that all members of the Association of Certificated Blind Masseurs referred to in the extract have been thoroughly trained and hold recognised qualifications? Finally, too much stress cannot be laid upon the fact that the members of the Association only undertake the treatment of patients with the consent and advice of a registered medical practitioner.

I am, Sir, yours faithfully,
BRUCE BRUCE-PORTER.

Grosvenor-street, W., Nov. 15th, 1920.

NERVOUS BREAKDOWN IN WOMEN AND CHILDREN.

UNTIL a short time ago the Lady Chichester Hospital for Women and Children at Hove, Sussex, was the only hospital in the United Kingdom devoted to the care in its early stages of nervous breakdown among women and children. The ninth annual report, for the year ending June, 1920, provides a short survey of its work for the past 15 years, during which time women and children have come to it from all parts of the country, and even from such distant places as Egypt and Nigeria. The experience of the hospital confirms the arguments in favour of establishing clinics for the treatment of mental disease in connexion with the general hospitals. Under the present system no hospital treatment is provided for the majority of mental patients until they have reached the certifiable and relatively incurable stage. What is urgently wanted for sufferers from mental disorder is the same prompt and easy access to treatment as is at the command of the sufferers from any physical disease. Of the value of such prompt treatment the survey here given affords interesting proof. A hundred consecutive cases treated at the Lady Chichester Hospital are analysed. They were of all ages, from 6–83 years, and came from all parts of the country and from many different occupations. Of the hundred, 54 were completely cured; 22 left the hospital without showing any improvement, none of them being a genuinely early case. Some had been ill for years, and might have been cured if they had been treated in time. Unfortunately, the hospital often has a waiting list five times as numerous as the patients under treatment.

WANTED—A COPY OF THE LANCET.

A correspondent has asked us to obtain for him a copy of THE LANCET of Sept. 14th, 1907. If any of our readers possess a copy, we shall be much obliged if they would mention the price which should be paid for it.

POOR-LAW INFIRMARY RECONSTRUCTION AT STEYNING.

SUGGESTIONS having been made by the medical officer for the better use of the infirmary as a surgical hospital and for other purposes, the Steyning (Sussex) Board of Guardians have decided that a room formerly used as a dispensary be fitted up for use as an operating theatre for minor operations. There are two objects in view: (1) To give the nurses better facilities in regard to their training; and (2) to be able to receive paying patients; while, still further, the medical officer has been requested to form a scheme to make the infirmary separate and distinct from the workhouse. In the discussion it was stated that the ratepayers would not be called upon to pay one penny in respect of the paying patients treated, this being self-supporting. The proposed charges for paying patients are £2 2*s*. to £3 3*s*., according to means, the medical officer's and anæsthetist's fees to be paid in addition for minor operations; and £1 11*s*. 6*d*. to £3 3*s*., according to means, and the other fees as in the previous category in addition, for maternity cases.

THE EFFECT OF FEEDING WITH THYROID PITUITARY AND PROSTATE.

WE have already given some of the recent results of thyroid feeding.[1] E. R. and M. M. Hopkins, *Endocrinology*, April, 1920, find that feeding of normal frog tadpoles with tablets made from the anterior lobe of the hypophysis and sugar of milk accelerates the metamorphosis. If at the beginning of the experiments the tadpoles are very small, the frogs after the metamorphosis are never so large as the control animals, and they are feebler. If tadpoles deprived of their thyroids, and hence, as far as we know, unlikely to undergo metamorphosis, are fed with the tablets metamorphosis begins within 24 hours, and advances rather slower than in normal animals, but a complete metamorphosis is not arrived at. It would thus appear that both the thyroid and pituitary glands are related to metamorphosis. It is highly doubtful if the result depends on traces of iodine. Other tissues containing iodine have not the same effect. The two glands stand physiologically in intimate relation the one to the other and can to a certain extent replace one another. The action of the two glands on tadpoles may be stated thus. The removal of the thyroids accelerates growth, leads to hyperplasia of the pituitary, but delays metamorphosis. Removal of the hypophysis slows growth of the animal and the development of the thyroid, retards metamorphosis, and delays the development of the cutaneous pigment. Feeding normal tadpoles with thyroid or pituitary substance accelerates metamorphosis. Feeding similar substances in thyroidless larvæ discharges, as it were, the missing metamorphosis. If hypophysis is fed to larvæ without their hypophysis growth is excited, but metamorphosis does not take place. Iodine seems to be able to discharge metamorphosis in larvæ deprived of either of these glands.

D. I. Macht has studied the effects of prostate feeding on the growth and development of tadpoles of certain species of rana, bufo, and amblyostoma.[2] Feeding was begun at an early stage—three weeks and continued for several weeks; pig's liver was also given, the controls getting only the latter in some cases with the addition of parotid and ovary. Prostate tissue was obtained from rams, bulls, and oxen, and sometimes human gland was obtainable. In all cases prostate feeding accelerated growth and metamorphosis. This may be due to an internal secretion of the prostate. In any case the prostate of the bull exerted a greater effect on tadpoles than that of the ox.

[1] THE LANCET, Sept. 4th, p. 509.
[2] Journal of Neurology, April, 1920.